②

AD-A203 105

# A STUDY TO DETERMINE THE AMBULATORY QUALITY ASSURANCE IMPACT OF A COMPUTER-STORED MEDICAL RECORDS SYSTEM UPON THE FAMILY PRACTICE CLINIC, SILAS B. HAYS ARMY COMMUNITY HOSPITAL, FT. ORD, CALIFORNIA

## DTIC
### SELECTED
JAN 2 3 1989

A Graduate Research Project

Submitted to the Faculty of

Baylor University

In Partial Fulfillment of the

Requirements for the Degree

of

Master of Health Administration

By

Captain Frank J. Berlingis, MSC

August 1982

89    1   18   058

# REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

| 1a. REPORT SECURITY CLASSIFICATION | 1b. RESTRICTIVE MARKINGS |
|---|---|
| Unclassified | |

| 2a. SECURITY CLASSIFICATION AUTHORITY | 3. DISTRIBUTION/AVAILABILITY OF REPORT |
|---|---|
| 2b. DECLASSIFICATION/DOWNGRADING SCHEDULE | Approved for public release; Distribution unlimited |

| 4. PERFORMING ORGANIZATION REPORT NUMBER(S) | 5. MONITORING ORGANIZATION REPORT NUMBER(S) |
|---|---|
| 89-88 | |

| 6a. NAME OF PERFORMING ORGANIZATION | 6b. OFFICE SYMBOL (If applicable) | 7a. NAME OF MONITORING ORGANIZATION |
|---|---|---|
| U.S. Army-Baylor University Graduate Program in Health Care | Admin/HSHA-IHC | |

| 6c. ADDRESS (City, State, and ZIP Code) | 7b. ADDRESS (City, State, and ZIP Code) |
|---|---|
| Ft Sam Houston, TX 78234-6100 | |

| 8a. NAME OF FUNDING/SPONSORING ORGANIZATION | 8b. OFFICE SYMBOL (If applicable) | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER |
|---|---|---|
| | | |

| 8c. ADDRESS (City, State, and ZIP Code) | 10. SOURCE OF FUNDING NUMBERS | | | |
|---|---|---|---|---|
| | PROGRAM ELEMENT NO. | PROJECT NO. | TASK NO. | WORK UNIT ACCESSION NO. |
| | | | | |

**11. TITLE (Include Security Classification)** A Study to Determine the Ambulatory Quality Assurance Impact of a Computer-Stored Medical Records System Upon the Family Practice Clinic, Silas B. Hays Army Community Hospital, Fort Ord, California

**12. PERSONAL AUTHOR(S)**
CPT Frank J. Berlingis

| 13a. TYPE OF REPORT | 13b. TIME COVERED | 14. DATE OF REPORT (Year, Month, Day) | 15. PAGE COUNT |
|---|---|---|---|
| Study | FROM Jul 82 TO Jul 83 | 1982 August | 128 |

**16. SUPPLEMENTARY NOTATION**

| 17. COSATI CODES | | | 18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number) |
|---|---|---|---|
| FIELD | GROUP | SUB-GROUP | (the Joint Commission on Accreditation of Hospitals) |
| | | | Health Care, Computerized Medical Records |

**19. ABSTRACT (Continue on reverse if necessary and identify by block number)**

Silas B. Hays Army Community Hospital was selected as the sole Army test site for a Computerized Medical Record Information System (CMRIS) for an eighteen-month period during 1981-82. This study focuses on the hospital's Family Practice Clinic. It seeks to determine whether JCAH quality assurance standards for ambulatory care services can be better satisfied through the use of a computerized medical record information system, than through the traditional manual auditing process. A definitive conclusion could not be drawn. The successful implementation and proliferation of a system like CMRIS will not be an easy task, but has the potential to add a new dimension to ambulatory quality assurance as it is known today. Keywords: Biomedical Information Systems, Medical Computer Applications, Records Management, Theses. (AW)

| 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT | 21. ABSTRACT SECURITY CLASSIFICATION |
|---|---|
| ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS | |

| 22a. NAME OF RESPONSIBLE INDIVIDUAL | 22b. TELEPHONE (Include Area Code) | 22c. OFFICE SYMBOL |
|---|---|---|
| Lawrence M. Leahy, MAJ, MS | (512) 221-6345/2324 | HSHA-IHC |

**DD Form 1473, JUN 86** — Previous editions are obsolete.

## ACKNOWLEDGEMENTS

# TABLE OF CONTENTS

TABLE OF CONTENTS, CONTINUED

# LIST OF CHARTS

## LIST OF FIGURES

# CHAPTER I

## INTRODUCTION

### Development of the Problem

#### Background

Quality assurance is probably as old as the art of medicine itself. The ancient code of King Hammurabi of Babylon dates back to 1800 B.C. and certainly represents a dramatic example of physician accountability.[1] The code specified that a surgeon would forfeit a hand if a nobleman-patient died or lost his sight as a result of the surgeon's intervention. Hippocrates provided insight into the meaning of quality medical care which is uniquely appropriate to the present:

> Life is short, and the Art long; the occasion fleeting;
> experience fallacious, and judgement difficult. The phy-
> sician must not only be prepared to do what is right him-
> self but also to make patients, the attendants, and the
> externals cooperate.[2]

Over the years, other insightful individuals have expressed the need to systematically assess the quality of care provided in a health care delivery system. The initial thrust of such assessments has been directed at quality evaluation within an inpatient setting. This has developed to the point where the majority of hospital medical and nursing staffs regularly evaluate the care which they provide.[3]

While advances in the inpatient setting have been impressive, there has not been a comparable development and

implementation of methods for the review and evaluation of ambulatory health care.[4] Although there was some justification for concentrating the early quality review efforts upon inpatient care--the task is an easier one, and the impact of suboptimal care is presumed to be greater for the hospitalized patient--continued emphasis solely upon inpatient treatment is no longer valid.

This is readily apparent if one views the ambulatory health care delivery system in terms of its scope. During the 1970s, a study conducted by the National Center for Health Statistics showed that there were close to one billion ambulatory visits annually compared to fewer than 30 million annual short-stay hospital discharges.[5] This represented an average of five outpatient discharges per person.

Continued emphasis solely upon inpatient care is invalidated further by the fact that many illnesses that do not result in hospitalization cause morbidity. Furthermore, ineffective ambulatory treatment, even if not actually harmful, wastes limited resources. The increased role of third parties such as Medicare, Medicaid, and private insurance in financing outpatient services, therefore, is supplying a most compelling impetus toward quality assurance (QA) activities. Yet another purpose for ambulatory QA emphasis centers around the control of rising malpractice costs by identifying and correcting grossly deficient practices which are performed by a small minority of physicians but which threaten the

profession as a whole.[6] Finally, there is an unmeasured but substantial demand for public accountability of the medical profession. This demand is part of the consumer movement and often expresses distrust of many established institutions, including organized medicine. Thus, despite the numerous problems involved in ambulatory care evaluation, there is a pressing need for effective methods of reviewing the quality of ambulatory care.

Methods of quality assessment differ according to the source of the data used, the aspect of the medical care system which is examined, the time at which that aspect is examined, the index used for deciding which cases will be selected for examination, and the criteria used to judge quality.[7] One aspect which is consistent throughout any quality assurance system, regardless of actual method utilized, is data dependency. Timely and accurate information abstracted from medical records forms the basis for assessing diagnostic and treatment practices. "An effective clinical information system is a 'sine qua non' in the design of quality assurance programs."[8]

It would seem logical, then, that, since automated health information systems have come to play an integral role in the operation of health care institutions, the timely and accurate data they produce would be used extensively for QA activities. Unfortunately, health information systems in primary ambulatory care settings have been designed and

employed to make planning and management decisions and to de-
scribe types of patients and problems seen in the ambulatory
setting.[9] While some exceptions do exist, the potential uses
of data from health information systems for assessing quality
of care have not been fully explored.

Two factors may explain why ambulatory care data sys-
tems have not been so used. First, because a large number of
presenting problems remain ill defined without clear diagnosis,
it is difficult to apply explicit criteria to evaluate ambula-
tory care.[10] Second, no strategies have been developed or
tested to compare the reliability or the accuracy of judgments
made from limited automated data with judgments made based
upon the complete medical record.[11] The key informational
element in the health care delivery system, therefore, remains
the individual patient record.

The medical record systems in general use today may
have been adequate when health care was limited in scope and
focused primarily upon the inpatient. Today, health care is
a far more complex operation involving both inpatient and out-
patient facilities. Ambulatory care, whether provided by a
family physician or other specialist, centers around large
numbers of patients who may be seen only infrequently. Diag-
nosis and treatment at all levels involve more variables than
in the past. The physician is expected not only to keep as-
pects of acute and chronic care under his surveillance but
also to consider a variety of preventive activities. He must,

further, coordinate his efforts with other physicians as well
as satisfy the ever-increasing governmental requirements.[12]
It is time, therefore, to explore innovative methods to col-
lect, process, store, retrieve, and communicate data and in-
formation in an efficient and flexible manner with the ulti-
mate goal of enhancing patient care.  Modern methods of
information management, specifically, a Computerized Medical
Record Information System (CMRIS), may be one answer which
can be applied to the achievement of optimal health care.

## Local conditions and applied
## research question

Silas B. Hays Army Community Hospital (SBHACH) was
selected by the Tri-Service Medical Information System (TRIMIS)
Program as the sole Army test site for a CMRIS.  The objec-
tive of this eighteen-month test is to define and validate the
following:

1. Health care provider patient record information require-
   ments.
2. Order entry/results reporting (OE/RR) formats and data
   requirements.
3. Data-sharing needs between wards/clinics and ancillary de-
   partments.
4. Similarities and differences in outpatient and inpatient
   OE/RR requirements.
5. Health care provider report requirements.
6. Methods of entering and retrieving information.[13]

Initial phases of the CMRIS test are concentrating upon applications specific to the Family Practice Clinic (FPC). The selection of this service is justified since it is the only specialty not bound by age group or organ system in defining the content of its medical care.

Since a primary project goal is to provide the family practice physician with a flexible patient medical information base designed to enhance the health care of the patient, this test provides an ideal opportunity to study methods by which a CMRIS can be used to meet ambulatory quality assurance objectives. Furthermore, such a study concomitant with a system test will insure that the basic issues of improved patient care will not be ignored in the hectic environment often associated with automation. Moreover, the study is necessary to avoid common misconceptions regarding hospital automation--specifically, the assumption that automation will invariably enhance patient care. Finally, overlaying CMRIS objectives with quality assurance issues could form the basis for broader ambulatory care applications if and when CMRIS is proliferated to other sites.

The study will concentrate upon the feasibility and the development of family practice quality assurance methods which can be supported by the data from a computer-based ambulatory information system. The need for such research becomes obvious when one examines a representative sample of Patient Care Evaluation Committee minutes. Several problems

become immediately apparent.

First, there is no standard method of auditing out-patient records. In fact, it is questionable in some cases whether the audit is done at all. Second, no compilations are provided regarding discrepancies which can be used as a teaching tool to improve records documentation. Third, integrating QA activities from ancillary services such as laboratory and pharmacy is difficult since the autonomous nature of the manual auditing process inhibits coordination and continuity. Finally, as addressed earlier, the majority of QA activities center around the inpatient, where the record is well documented and complete.

In light of the limited emphasis placed upon the use of computerized systems for QA assessment which pervades the ambulatory health care industry in general and the specific need of SBHACH to emphasize quality patient care during a period of automation testing, this project was undertaken to answer the following applied research question: Can prescribed Joint Commission on Accreditation of Hospitals (JCAH) quality assurance standards for ambulatory care services be better satisfied in the SBHACH Family Practice Clinic through the use of a computerized medical record information system?

## Objectives, criteria, and limitations

The JCAH has adopted standards entitled "Hospital-Sponsored Ambulatory Care Services." These have replaced the

"Outpatient Services" section of the <u>Accreditation Manual</u>
<u>for Hospitals</u>. In addition, JCAH has also published an ac-
creditation manual specifically for ambulatory health care.
Both sets of standards reflect JCAH's recognition of the
increasing importance of ambulatory care for delivery of
patient care services within hospitals and freestanding
clinics.[14] Using these rather broad and purposely generic
standards as guidelines, the objectives of the study are:

1. To assist in the defining and validation process outlined
   in the CMRIS objectives with primary emphasis upon the
   development of ambulatory quality assurance methodologies.

2. To review JCAH standards with regard to the specific
   functions within family practice and analyze how ambula-
   tory services can be managed with the same degree of
   concern for quality as is displayed in inpatient opera-
   tions.

3. To begin the ongoing process of criteria development in
   conjunction with stated medical needs and desires which
   can be used to access the CMRIS data base, resulting in
   reports which are directly applicable to family practice
   ambulatory QA activities.

4. To analyze the usefulness of automated assessment proce-
   dures in QA monitoring.

5. To provide input regarding the feasibility of proliferat-
   ing the concept of evaluating ambulatory care with a CMRIS
   based upon system developmental progress throughout the
   study.

It should be noted that, although JCAH criteria will act as the basic guide throughout, they are written to accommodate the dynamic nature of the ambulatory care field and to reflect the belief that the quality of patient care should be consistent across health care settings.[15] Their intent is to provide ambulatory care organizations with a framework for developing unique and innovative techniques. It is hoped that this research will give rise to such techniques.

The following limitations were imposed from the onset of this study:

1. The development of QA specifications cannot alter the current contract between TRIMIS and Libra Technology, the prime contractor.

2. The scope of the study is limited to the development of ambulatory QA procedures associated with the CMRIS, to include Family Practice Clinic and laboratory and pharmacy operations. The study will not address the proposed inpatient interface either as a stand-alone system or as a part of the automated Patient Administration System.

3. Although the study will touch upon issues relating to proliferation to other ambulatory care clinics, research will be limited to the family practice setting with associated ancillary spin-offs.

## Unforeseen factors influencing the study

During initial phases of implementation, the CMRIS

appeared to be on schedule and proceeding according to mile-
stone dates. Initial study efforts were, therefore, geared
toward specific events and the QA-related advantages those
events would bring.

Four months into the system test, it became apparent
that the system was suffering from a user acceptance problem,
the severity of which surprised even the developer. Due to
a host of reasons, including lack of proper user training,
perception of unwillingness on the part of system designers
to make changes perceived as crucial, poor managerial support
of the system, and unreliable data, it was decided that the
test would come to an immediate halt. Problems, whether real
or imagined, became so severe that consideration was given to
permanently discontinuing the test of the CMRIS at SBHACH. A
high level team was immediately dispatched from TRIMIS in an
attempt to rectify this serious situation so that the CMRIS
test could continue. After a series of negotiations and user
acceptance training sessions, a compromise was reached that
would allow for test continuation based upon the implementa-
tion of changes outlined by the users.

Breakdown of the system test was initially viewed as
a virtual death knell for this study. It became apparent,
however, as the negotiation process continued, that elements
of the study were, in fact, being used to pinpoint problem
areas heretofore viewed only in a visceral sense. In addi-
tion, CMRIS potential denoted by early research efforts added

a dimension of positive feedback that aided in the restoration of confidence.

As a result, the study continued with its original objectives but with the unexpected aspects brought about by the near system demise. Wherever applicable, these aspects have been incorporated into the research to demonstrate their impact upon quality assurance activities.

## Review of the Literature

The current state of the art in the utilization of information systems to support quality assurance in hospitals is limited. Although several examples of useful systems are documented, the literature indicates that these are for the most part experimental and developmental and have not been widely utilized in American hospitals.[16] A survey of Georgia hospitals, for example, showed that fewer than 35 percent of the responding institutions were using inhouse computer systems or outside data-processing services for quality assurance applications. A national survey evinced similar results, with very limited application of computer systems to quality assurance activities.[17]

The research conducted on those facilities which have used automated systems for QA has yielded some interesting results. Evaluative research in a 550-bed teaching hospital was carried out to determine whether the benefits gained from such systems were cost justified. The major findings can be

summarized as follows:

1. The development of a useful, retrospective computerized quality review system is feasible.

2. Such a system is potentially cost effective, but full savings can be realized only by proliferation to a number of hospitals through minor modifications.

3. The costs can be reduced by integration with existing systems.

4. A high level of physician interest in medical care review can be achieved.[18]

Several studies have shown that the major problems found in medical audit systems relate to the difficulty of definition of data and selection of criteria used to conduct audits. It has been concluded that the major obstacles of systems development are inadequate patient data, unreasonable evaluation criteria, and insensitive audit procedures.[19] Two studies conducted by the Institute of Medicine raised serious questions about the reliability and the adequacy of discharge data abstracted from patients' medical records.[20] An automated system can presumably overcome this problem by making data collection an integral part of the patient care recording process and by not requiring a separate abstraction process. The COSTAR (Computer Stored Ambulatory Record) System used by the Harvard Community Health Plan is such a program.[21] In this plan, the information recorded at the time of treatment is entered directly into a computer and used for

concurrent quality assurance purposes.

The computer has also been shown to be useful for utilization review purposes. This has ranged from providing data for admission certification, length of stay certification, and medical care evaluation studies to the actual development of criteria for monitoring utilization.[22] A study of one such system was carried out in twenty West Pennsylvania hospitals. Computerized screening compared favorably to similar review by both records clerks and health professionals. A major benefit was the capability to review 100 percent of the records rather than a sampling, as required by manual methods.[23]

Innovative methods of concurrent quality audit using a computer as a protocol-based reminder system are also possible. Once standard tasks or criteria developed by physicians are stored in a computer file, the system will automatically produce a "reminder" for those cases not meeting the prescribed criteria. Systems of this kind have been shown to enhance quality of care and may well be the purest form of quality "assurance," since retrospective audits are more correctly labeled quality assessment.[24] Further studies suggest that prospective reminders do reduce clinical errors and improve quality of nursing care.[25] It has even been suggested that the only way to facilitate quality of care evaluation is by the use of standardized protocols and reminder lists that can guide the appropriate treatment and care regimens.[26]

Patient satisfaction has become a recognized factor in measuring medical care quality. The public demand for greater consumer accountability has given rise to the use of computers for monitoring patient satisfaction. Studies carried out in a variety of settings concluded that the patient's perception of care often differs from that measured by peer review or retrospective record audit.[27]

Quality of care, although primarily measured from the provider-patient encounter, also depends upon the proper management of resources. Management processes in hospitals are information dependent, requiring data which are relevant, timely, accurate, and sensitive. Some studies have been made using the computer to assist in administrative planning and control.[28] For the most part, however, hospital information systems have not yet met their potential in providing effective information for management planning, evaluation, and control.[29]

In summary, review of the literature indicates that information systems have not been used extensively as an aid to quality assurance in hospitals. Few operational systems are reported. Several reasons for this run consistently throughout the literature, of which the following is only an example:

(1) Lack of standardization in data definitions . . . and lack of agreement on standard criteria to be utilized for medical audit have slowed the development of generalized systems which could be used in multiple hospitals. . . .

(2) Lack of integration of information systems in hospitals inhibits the building of a reliable data base for quality assurance purposes. . . .

(3) . . . inability of most hospitals to integrate clinical and financial data makes it virtually impossible to use hospital information effectively for management planning and cost control purposes.

(4) Vendors of computer software have not given high priority to the development of clinical software packages . . . concentrating instead on the more lucrative administrative areas such as financial systems.

(5) There have been problems in obtaining physician acceptance for the use of standardized protocols and reminder lists of diagnostic and therapeutic procedures in medical practice, even though such systems have been shown to be effective in improving the quality of care rendered to patients.

(6) There are a set of generic problems which have inhibited the development of all types of information systems in hospitals, and quality assurance systems have been affected by these problems. The major problem areas include: (a) inadequate systems analysis and design prior to implementation of a new system; (b) underfunding of the system development effort; and (c) inadequate involvement and lack of sophistication of top administrators in systems planning and design.

(7) Efforts at the national level by professional associations to develop standard systems of quality assurance and performance control have been limited and have not yet met with general acceptance . . . .

(8) Small hospitals, those of 150-beds or fewer, have been neglected in the work on quality assurance systems. Most systems developed to date require large scale computer capabilities, and very few small hospitals can afford the investment in hardware and software which would be required to implement these systems in their institutions.[30]

## Research Methodology

The following process will be utilized in order to carry out study objectives:

1. Conduct indepth interviews and attend formal training sessions in order to become thoroughly familiar with the capabilities and the limitations of the computer-stored medical record information system.

2.  Validate vendor claims of functional user flexibility in order to determine the feasibility of report creation/ modification.

3.  Review in detail those JCAH standards applicable to ambu-latory care and assess current level of compliance.

4.  Determine how the CMRIS capabilities can be utilized to enhance quality of care. This will entail making a sys-tem evaluation based upon the following specifications:

    a.  A vast number of specific items of clinical data, unique and categorical, some recent, some as old as the patient, must be available for selective retrieval. Family "linkages" must integrate relevant information of individual family members.

    b.  Multiple providers and multiple sites will require independent, often simultaneous access to relevant health-related data regardless of time or location. This implies both data "aggregation" (entry of data from many remote sites) and "multiple-access" (capa-bility of geographically dispersed settings to inde-pendently retrieve centrally stored data).

    c.  Continued surveillance regarding the status of all types of recorded clinical data must be maintained. The record must alert the clinician to risk situ-ations before conflicting actions are taken or un-attended risks proceed to adverse event.

    d.  Chart review and selective or comprehensive review

of patient management will require rapid, inexpensive, and flexible retrieval of a large variety of clinical data related to individuals, disease categories, and patient populations.

e. Reporting of all clinical encounters or statistically valid sampling of inpatient and outpatient services on a frequent, perhaps daily, basis is essential for valid short-term and long-term epidemiological and planning studies.

f. Detailed information regarding community health patterns must be available to medical educators and researchers for effective planning of curricula and research efforts. Students studying individual cases should be able to retrieve clinical data rapidly as a preliminary to understanding and interpretation.

g. Standard accounting parameters, itemization of clinical services, and clinical outcome measures will be required.

h. Data should be available only to those having a legal right of access. The entire information system must be secure against illegal use by unauthorized persons.[31]

5. Compare the system evaluation results (4, above) with JCAH standards and evaluate potential compliance by using actual CMRIS output reports specifically formatted for quality assurance in an ambulatory setting.

6. Based upon 5, above, speculate in regard to the feasibility

of proliferating a CMRIS program to other clinics.

## Footnotes

[1] Paul Bataldin and J. Paul O'Conner, <u>Quality Assurance in Ambulatory Care</u> (Germantown, Md.: Aspen Systems Corporation, 1980), p. 2.

[2] Francis Adams, trans., <u>The Genuine Works of Hippocrates</u>, vol. 2 (London: Sydenham Society, 1969), p. 697.

[3] Sallie Manley, "Majority of Hospitals Conduct Medical Audit," <u>Hospitals</u> 50 (1 June 1976): 88.

[4] American Society of Internal Medicine, <u>Assessing Physician Performance in Ambulatory Care</u>, Proceedings (San Francisco: American Society of Internal Medicine, 1976).

[5] U.S., Department of Health, Education, and Welfare, Health Resources Administration, National Committee on Vital and Health Statistics, <u>Ambulatory Medical Care Records--Uniform Minimum Basic Data Set: Final Report</u>, Vital and Health Statistics Documents and Committee Reports, Series No. 4, No. 16, DHEW Publication No. (HRA) 75-1453 (Washington, D.C.: Government Printing Office, August, 1974).

[6] Richard K. Hill, "Quality Assurance in Ambulatory Care," <u>Primary Care</u> 7 (December 1980): 713-14.

[7] Ibid., p. 714.

[8] Charles J. Austin and Harry S. Carter, "Hospital Information Systems and Quality Assurance," <u>Hospital and Health Services Administration</u> 26 (Fall 1981): 42.

[9] Charles W. Given, et al., "Evaluating Primary Ambulatory Care with a Health Information System," <u>The Journal of Family Practice</u> 12 (February 1981): 293.

[10] Martin Bass, "Approaches to the Denominator Problem and Primary Care Research," <u>The Journal of Family Practice</u> 3 (February 1976): 193.

[11] Jerome H. Grassman, et al., "An Automated Medical Record System," <u>Journal of the American Medical Association</u> 224 (18 June 1973): 1616.

[12] Daniel Levinson, "Information Management in Clinical Practice," <u>The Journal of Family Practice</u> 7 (October 1978): 800.

[13]TRIMIS Program Office, Computerized Medical Record Information System/Order Entry/Results Reporting Pilot Test, Silas B. Hays Army Community Hospital, Ft. Ord, California, issues meeting, Washington, D.C., March 3, 1982.

[14]Joint Commission on Accreditation of Hospitals (JCAH), The 1982 Accreditation Manual for Ambulatory Health Care (Chicago: JCAH, 1982), p. 7.

[15]Ibid., p. 5.

[16]Austin and Carter, p. 43.

[17]Ibid., pp. 49-50.

[18]James B. Martin, "Towards Effective Computer-Aided Medical Care Evaluation Studies," Inquiry 15 (June 1978): 139-40.

[19]William H. Frazier and Donald A. Brand, "Quality Assessment and the Art of Medicine," Medical Care 17 (May 1979): 480.

[20]Linda K. Demlo, et al., "Reliability of Information Abstracted from Patient's Medical Records," Medical Care 16 (December 1978): 997.

[21]G. Octo Barnett, et al., "Quality Assurance through Automated Monitoring and Concurrent Feedback Using a Computer-Based Medical Information System," Medical Care 16 (December 1978): 963.

[22]Homer Schmitz and William C. Schoenhard, "Automated Utilization Review Is Timely, Accurate, Efficient," Hospital Progress 57 (July 1976): 74.

[23]George A. Huber, et al., "Evaluating Computerized Screening as an Aid to Utilization Review," Inquiry 11 (September 1974): 188.

[24]Charles J. Austin, Information Systems for Hospital Administration (Ann Arbor, Mich.: Health Administration Press, 1979), p. 167.

[25]June B. Somers, "A Computerized Nursing Care System," Hospitals 45 (16 April 1971): 93.

[26]David Wirtschafter and Emmanuel Mesel, "A Strategy for Redesigning the Medical Record for Quality Assurance," Medical Care 14 (January 1976): 70.

[27]Jay L. Lebow, "Consumer Assessments of the Quality of Medical Care," Medical Care 12 (April 1974): 333-35.

[28]Ronald Mills, et al., "AUTOGRP: An Interactive Computer System for the Analysis of Health Care Data," Medical Care 14 (July 1976): 604.

[29]Charles J. Austin and Barry R. Greene, "Hospital Information Systems: A Current Perspective," Inquiry 15 (June 1978): 99.

[30]Austin and Carter, pp. 53-54.

[31]Levinson, pp. 801-2.

# CHAPTER II

## DISCUSSION

### Computer-Stored Medical Record
### Information System

The installation of a CMRIS program in the Family

Practice Clinic at SBHACH represents the first attempt by an

Army medical treatment facility to capture outpatient data

by means of automated medical record abstraction. The pro-

ject is designed for installation in the following steps:

1.  Phase one--The basic system is tailored for the Family

    Practice Clinic (FPC) to provide the functions of regis-

    tration, scheduling, and medical data entry.

2.  Phase two--The basic system will be enhanced to include

    order entry/results reporting functions. Ordering from

    the FPC to the laboratory and return of the respective

    results will be accomplished. In addition, the entry of

    pharmacy medication orders will also be automated.

3.  Phase three--The same functions installed in the FPC will

    be proliferated to the Internal Medicine Clinic.[1]

    The research effort was initiated during the phase

one implementation process. The assessment of quality assur-

ance potential from the very onset of implementation was not

considered premature since it was believed that emphasis upon

quality patient care would act as a focus to keep systems

efforts on track. Long-range objectives for phase one of implementation were identified as:

1. Enhance patient care by improving availability, accessibility, timeliness of retrieval, legibility, and organization of medical information.

2. Facilitate medical practice administration by providing the data retrieval and analysis capability required by management for day-to-day operation, budgeting, and planning.

3. Furnish data-processing support for administration and ancillary services (e.g., scheduling, laboratory, pharmacy, and planning).

4. Provide the capability to generate routine management reports and support user-identified inquiry and report generation on any elements of the data base.

5. Support programs of quality assurance by monitoring the content of the data base according to user-specified rules and report deviations from those standards of care.[2]

## System modules

A basic design concept of the CMRIS is that of a modular system which makes available a large variety of options. This concept was employed to provide the flexibility to meet specific practice needs. The modules which are basic to the system are:

1. Security and integrity module--These routines, which are

an integral part of all modules, provide for identifying
and logging in/out all terminals and users to prevent un-
authorized access to medical and administrative informa-
tion. The module also provides the support routines to
monitor the functioning of the system, provide transaction
logging, and prevent data loss in case of machine failure.

2. Registration module--These interactive routines are used
for the entry and review of all identification data (demo-
graphic, insurance, and administrative) for each patient
and family. A small set of data is required in any im-
plementation of the registration mode. It is possible
for the practice to select the remaining items to be col-
lected in the registration sequence from a large "menu"
of pre-coded fields and, if necessary, to define addi-
tional registration items.

3. Medical record module--This module represents the core of
the information system and provides a large variety of
options for recording, manipulating, organizing, and dis-
playing data. All medical data are collected by the medi-
cal staff using encounter forms designed for the unique
needs of the particular practice. The information on the
forms is entered into the computer system by clerical
staff using computer terminals directly connected to the
computer. This module contains both the data entry rou-
tine and the routines which provide accessibility to the
total medical and administrative data base. Direct

inquiry into this data base can be accomplished through all computer terminals specified by the practice as having the authority to access medical information (e.g., terminals in the medical records room and in the care areas). This information is also used to prepare the computer-generated medical record (status report) which is made available for each scheduled visit.

4. Scheduling module--This set of routines allows on-line booking and cancellation of appointments, review of current appointments, and production of legible, accurate schedules and day sheets. A minimal registration sequence for the scheduling of nonmembers or new patients is available.

5. Management reporting module--These routines allow the practice to specify the parameters for search routines which operate on the data base to produce patient listings and routine tabulations and cross-tabulations.

CMRIS operation

The basic CMRIS operational flow is depicted in Figure 1. Key documents involved in system operation are shown in Appendix A and include the registration form, the encounter form, and the patient status report.

The operation of the CMRIS differs from a manual medical record system in the following areas:

1. The FPC must enter a set of registration data on each

```
                          ┌──────────────┐
                          │    CMRIS     │◄──────────────────┐
                          │    File      │                   │
                          └──────┬───────┘                   │
                                 │                           │
                          ┌──────▼───────┐                   │
                          │   Patient    │                   │
                          │ Registration │                   │
                          └──────┬───────┘                   │
         ━━━━━━━━━━━━━━━━━━━━━━━━┿━━━━━━━━━━━━━━━━━━━━━━━━     │
                    ┌────────────┴──────┐                     │
            ┌───────▼──────┐     ┌───────▼──────┐             │
            │  Appoint-    │     │   Walk-in    │             │
            │    ment      │     │   Patient    │             │
            │    Made      │     │              │             │
            └──────┬───────┘     └──────┬───────┘             │
  ┌──────────┐     │             ┌──────▼───────┐             │
  │  "Pull   │◄----┤             │   Pick Up    │             │
  │  List"   │  ┌──▼──────────┐  │   Medical    │             │
  │ Produced │  │ Scheduling  │  │   Records    │             │
  └────┬─────┘  └──┬──────────┘  └──────┬───────┘             │
  ┌────▼─────┐     │                    │                     │
  │ Medical  │     │                    │                     │
  │ Records  │----►│   Clinic           │                     │
  │ Section  │     │   Visit            │                     │
  └──────────┘     └──────┬─────────────┘                     │
```
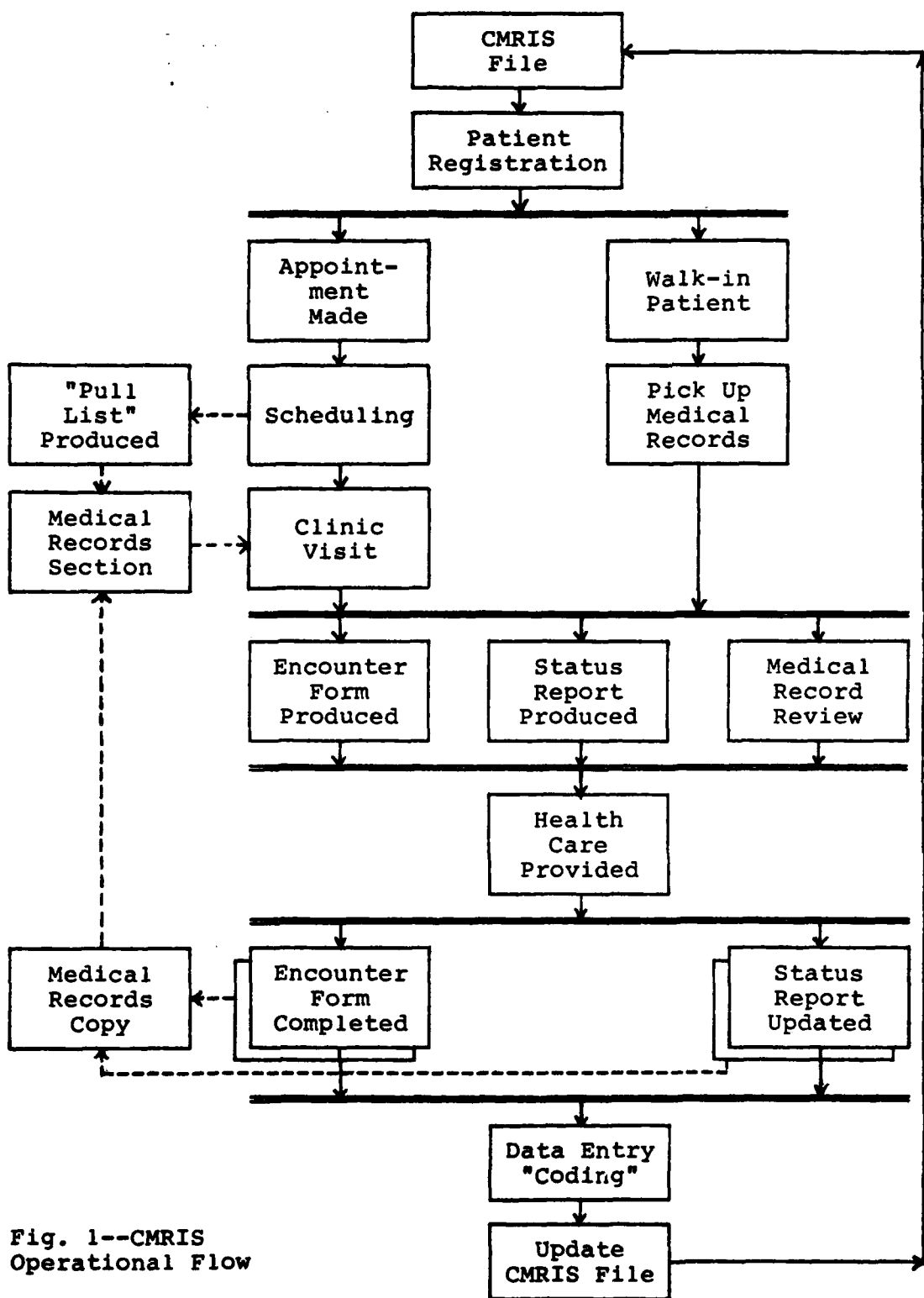
Fig. 1--CMRIS Operational Flow

patient. This provides a single data file which is always available for patient identification, family linkage, and demographic information. This file can be accessed by authorized users at remote terminals by either patient number or alphabetic name look-up.

2. The data are collected at each patient visit by recording both administrative and medical information on a form which is specifically designed for the needs of the particular medical group and/or specialty. This encounter form is designed to capture all data which providers routinely collect in clinical practice. The use of this single source document facilitates practice efficiency and data integrity. The data collected on this single document supply the multiple needs of medical records, management reporting, quality assurance, medical audit, and research. The encounter form provides for the recording of information in a structured format so that each particular datum is uniquely identified. The provider records the specific medical data for the patient by checking the appropriate item on a self-encoded check list and writing the name of the item. Further detailed information concerning diagnoses, therapies, test results, etc., is recorded in narrative text. All narrative information is linked to the encoded information and is always accessed and displayed with this code.

3. The medical record data provided by the CMRIS represent

the most up-to-date information. Additionally, the CMRIS
can display medical information in the temporal sequence
in which it was entered. The information is presented in
a form that facilitates scanning of the relevant data in
a minimal period of time.[4]

### Report Creation/Modification Capability

At project onset, only those reports identified as rou-
tine were produced on a scheduled basis. A representative sam-
ple of recurring reports with QA potential is presented in
Appendix B. Although such reports would subsequently be as-
sessed for their QA usefulness, it was first necessary to
validate a system feature heretofore unused, i.e., the ad hoc
report generator. The demonstration of such report-generation
capability was crucial for the ultimate success of this study.

The ad hoc report generator can be queried only by
the system manager. The validation test, therefore, began
with a request for separate reports, each designed to chal-
lenge the data collected by a specific system module. Ideas
for report topics came from family practice physicians as
well as from the literature.[5] The results of this initial
test are depicted in Chart 1. The reports produced for this
test are shown in Appendix C.

### JCAH Standards and Current
### Level of Compliance

The project continued with a thorough review of the

| Module Tested | Report Created | Time Required | Output Success? |
|---|---|---|---|
| Security | None--Attempt by Un-authorized User | -- | Yes |
| Scheduling | Nurse Workload Report Table of Appointment Class | < 24 Hours | Yes |
| Registration | Roster and Selected Patient Data for Dr. X | < 24 Hours | Yes |
| Medical Data | Diabetes Audit Panel | < 24 Hours | Yes |

Chart 1--Results of Initial Test of
Ad Hoc Report Generator

standards published by the JCAH so that CMRIS QA efforts
could focus upon those items considered essential for quality
patient care. In addition, data distributed at the Fifth
Ambulatory Patient Care Conference held at the Academy of
Health Sciences, Ft. Sam Houston, Texas, March 28-April 2,
1982, were used to assess the scope of QA deficiencies in
ambulatory care commandwide. Again, this was considered the
most optimal method of focusing CMRIS capabilities to meet QA
needs. Finally, current QA mechanisms used in the FPC were
reviewed in order to determine level of compliance and further
ascertain if a CMRIS could enhance present methods.

The results of this review both on the macro and on
the micro level are summarized in Chart 2 and Table 1. In
Chart 2, JCAH ambulatory care standards applicable to this
project are divided into two broad categories--(1) quality
assurance and (2) medical records. JCAH criteria for these

| Criterion (1) | FPC Compliance? (2) | OMRIS "Interface"? (3) |
|---|---|---|
| **I. QUALITY ASSURANCE** | | |
| **Standard:** The organization demonstrates a consistent endeavor to deliver patient care that is effective within available resources and consistent with achievable goals. A major component in the application of this principle is the operation of a quality assurance program. | | |
| 1. At least the following quality control mechanisms shall be established: | | |
| a. Coordination of a scheduling & staffing plan that facilitates accessibility & continuity of care & that minimizes patient waiting time | Yes | Yes |
| b. System for follow-up of broken appointments as well as evaluation of effectiveness of system | | Yes |
| c. Timely review, interpretation, & reporting, as appropriate, of diagnostic radiographic studies, laboratory tests, & electrocardiograms, to be available to practitioner requesting such services in provision of ambulatory care | In Part | Yes |
| NOTE: Reports on patients scheduled for surgery shall be made available to the responsible practitioner before surgery is performed. A mechanism shall be established for notifying & recalling patients who require repeat or additional studies or for whom further consultation is appropriate. | | |
| d. Means of assuring that ambulatory surgical patients treated in facility under other than local anesthesia receive same preoperative & postoperative evaluations as patients undergoing same surgical procedures on an inpatient basis | NA | NA |
| e. Systematic review & evaluation of surgical patients who require hospitalization following ambulatory surgery | NA | NA |
| f. Examination of surgical specimens by a pathologist | Yes | No |

Chart 2—Family Practice Clinic Compliance and OMRIS Interface with JCAH Standards and Criteria

| Criterion (1) | FPC Compliance? (2) | CMRIS "Interface"? (3) |
|---|---|---|
| **I.  QUALITY ASSURANCE—Continued** | | |
| g. Copy of record or summary of ambulatory care services to private practitioner or medical facility responsible for follow-up care when authorized & appropriate | Yes | Yes |
| h. Maintenance & evaluation of patient drug profiles, whenever possible | In Part | Yes |
| i. Inclusion of ambulatory care patients who receive antibiotics in medical staff review of clinical use of antibiotics | Yes | Yes |
| j. Inclusion of ambulatory care patients who receive blood transfusions in medical staff review of blood utilization | Yes | Yes |
| k. Compliance with requirements of Radiology Services section of Accreditation Manual for Hospitals when facility provides radiation therapy for ambulatory patients | Yes | No |
| l. Means of communicating in language of predominant population groups served | In Part | No |

**II.  MEDICAL RECORDS**

Standard:  The organization maintains a medical record system that permits prompt retrieval of information. Medical records are legible, documented accurately in a timely manner, and readily accessible to health care practitioners.

2. Prior pertinent medical record information shall be available to attending practitioner and other authorized individuals. Following information shall be documented in each patient medical record; at time of each ambulatory care visit, any required updating of such information shall be accomplished and any pertinent new information entered:

a. Patient identification
b. Relevant history of illness/injury & physical findings
c. Diagnostic & therapeutic orders

Chart 2—Continued

| Criterion (1) | FPC Compliance? (2) | OMRIS "Interface"? (3) |
|---|---|---|
| **II. MEDICAL RECORDS—Continued** | | |
| d. Clinical observations, including results of treatment<br>e. Reports of procedures, tests, & results<br>f. Diagnostic impression<br>g. Patient disposition & any pertinent instructions given to patient and/or family for follow-up care<br>h. Immunization record<br>i. Any allergy history<br>j. Growth charts for pediatric patients<br>k. Referral information to & from outside agencies | In Part | In Part |
| 3. Except as required by law, any record that contains clinical, social, financial, or other data on a particular patient shall be treated in a strictly confidential manner & reasonably protected from loss, tampering, alteration, destruction, & unauthorized or inadvertent disclosure of information | Yes | Yes |
| 4. An individual shall be in charge of medical records; individual's responsibilities shall include, but not be limited to, the following:<br>a. Maintaining confidentiality, security, & physical safety of patient records<br>b. Maintaining unique identification of each patient record<br>c. Supervising collection, processing, maintenance, storage, timely retrieval, & distribution of records<br>d. Maintaining predetermined, organized medical record format | Yes | No |
| 5. Reports, histories, & physicals; progress notes; & other materials (such as laboratory reports, X-ray readings, & consultations) shall be incorporated into records in a timely manner | In Part | Yes |

Chart 2—Continued

## II. MEDICAL RECORDS—Continued

| Criterion (1) | FPC Compliance? (2) | CMRIS "Interface"? (3) |
|---|---|---|
| 6. Summary list of significant past surgical procedures & past & current diagnoses or problems shall be conspicuously documented in each patient medical record to facilitate ongoing provision of effective medical care: | | |
| a. Summary list shall be legibly recorded in same location in all patient records | In Part | Yes |
| b. Summary list will not repeat problems or diagnoses that recur during ongoing treatment | | |
| c. Summary list will include, but not be limited to, the following:<br>(1) Significant surgical conditions<br>(2) Significant medical conditions<br>(3) Any allergies & untoward reactions to drugs<br>(4) Currently or recently used medications | | |
| 7. Entries in patient records shall be legible to clinical personnel | In Part | Yes |
| 8. Review & evaluation of quality & appropriateness of ambulatory care services shall be performed at least twice annually & involve use of medical record & preestablished criteria | Yes | Yes |

Chart 2—Continued

TABLE 1
JCAH MEDICAL RECORD AND QUALITY ASSURANCE FINDINGS
HEALTH SERVICES COMMANDWIDE, 1981

| Unmet Criterion | Number of Occurrences |
|---|---|
| **Medical Records:** | |
| Emergency medical records must include condition of patient on release and have instructions to patient or family | 3 |
| All entries must be legible | 2 |
| All entries must be dated | 8 |
| All diagnoses must be recorded in full, without abbreviations or symbols | 5 |
| Antibiotics must be documented | 2[a] |
| **Quality Assurance:** | |
| Ongoing review of use of antibiotics must be documented, along with appropriate action as required by findings; written criteria should be used in review of antibiotic usage | 7 |
| Review and evaluation of quality and appropriateness of ambulatory care services shall be performed at least twice annually and involve use of medical record and preestablished criteria | 7 |
| Review and evaluation of quality and appropriateness of emergency patient care shall be performed on at least a monthly basis and documented | 6 |
| Realistic priorities shall be set for assessment/resolution of important problems | 5 |
| Criteria must be written | 5 |
| QA actions must be documented | 9 |
| There must be an effective plan for assuring that problems have been eliminated or reduced (follow-up) | 4 |
| Written QA plan must delineate lines of authority, accountability, and communication | 3 |
| Written criteria that relate to essential or critical aspects of patient care shall be used to assess problems | 1 |
| There shall be coordination of a scheduling and staffing plan that minimizes patient waiting time | 1 |

---

[a]There were also seven findings in QA.

categories are listed in Column 1. Column 2 indicates whether the SBHACH FPC is fulfilling in some way the intent of the standard as evidenced by performance and documentation. "In part" indicates that compliance could be improved. Column 3 indicates whether the CMRIS could in some way influence the standard described. It should be noted that a "Yes" in Column 3 does not assume the standard can be positively influenced by the CMRIS but merely denotes an interface between the system's objectives and the JCAH standard. The identification of this interface is crucial in determining what JCAH criteria should ultimately be used to assess QA enhancement by the CMRIS. Table 1 summarizes common JCAH findings for 1981 by the broad categories outlined above.

## CMRIS Evaluation

Having identified several JCAH criteria that interface and are potentially impacted by the CMRIS, an evaluation was made to determine the system's capability to assist in the FPC ongoing quality assurance efforts. Demonstrating the system's capability to meet or exceed a specific JCAH criterion was not considered an adequate evaluation strategy, since other potential QA benefits may be overlooked by such a narrow view. It was decided, therefore, that a more beneficial assessment strategy would be to evaluate the CMRIS against generally accepted health care delivery specifications. Such an approch was also considered necessary in light of the user acceptability problems alluded to previously.

The outcome of this evaluation could then be compared to pre-
scribed JCAH standards in order to determine if, in fact, the
CMRIS could better satisfy these standards.

Eight specifications were ultimately chosen for the
evaluation. The eight specifications are essential elements
of any health care system which meets the standards of the
profession and the expectations of an enlightened public.[6]
Evaluation results are shown in Chart 3. Column 1 describes
the health care specification. Column 2 represents a brief
synopsis of how, according to the literature, an automated
system could be used to meet that specification.[7] Column 3
describes CMRIS capabilities or shortcomings in meeting that
specification. Wherever possible, actual output reports were
produced to support the specification.

### Utilizing CMRIS Data to Assess
### Quality Assurance Standards

Information gathered and reports generated during the
system evaluation were analyzed with respect to specific JCAH
criteria shown in Chart 2. Development and generation of
these reports were a crucial part of this research effort
since, in many cases, they represented the sole basis for
validating system QA capability. Furthermore, due to the de-
lay in system implementation, subsequent phases which will
theoretically offer QA enhancements could not be tested di-
rectly. It is apparent, however, that the order entry/results
reporting capability available with implementation of phase

| Health Care Specification (1) | Automated System Capability (2) | CMRIS Capability/Shortcoming (3) |
|---|---|---|
| Health care must be comprehensive. This includes acute and chronic illness as well as social and psychological problems and provides for prevention and rehabilitation. Care is provided to individual and family covering entire life span. | Large amounts of data, unique and categorical, both recent and historical, are selectively retrievable. | Data retrieval can be accomplished through flexible report generator. This enables chronological data to be displayed. Family data can be linked by registration module. Status report can act as an "index" to patient's care. Proper data entry is crucial to this process. |
| Health care personnel and facilities must be integrated. Services may involve several providers working together in different ways depending upon patient. Administrative and other support personnel are essential to process. Care is provided in a variety of settings, information from which must be cohesive. | Multiple providers working in different sites can gain access to data base. Data can be entered from remote sites and be retrieved from a centrally stored data base. | CMRIS in its current test configuration operates only for FPC. Lab and pharmacy data will be integrated during subsequent phases. Access to data base benefits only FPC. |
| System must be alert to high-risk situations. Risk situations such as suspicious physical findings, abnormal lab tests, drug allergy, failure to follow up, or omission of immunizations must be solved on a high priority basis. | System provides continuous surveillance regarding the status of clinical data and automatically alerts the provider to risk situations to facilitate action prior to adverse event. | "Scan" Set capability allows user to extract routine data sets pertaining to specific problems and review patient records for equivalent matches. "Plan" Set capability allows user to specify expected standards (protocols) which can be surveyed by the system. System will automatically identify exceptions. This feature requires full implementation of all phases. |

Chart 3—CMRIS Evaluation Results

| Health Care Specification (1) | Automated System Capability (2) | OMRIS Capability/Shortcoming (3) |
|---|---|---|
| Health care process must be audited and evaluated. Ongoing audit of care is a vital part of continuing education and administrative efforts to achieve optimal results. Medical treatment activities must be evaluated in terms of absolute effectiveness and cost-benefit considerations. | Comprehensive review of patient management can be accomplished due to rapid, inexpensive, and flexible retrieval of a large variety of clinical data related to individual disease categories and patient populations. | Review is possible through flexible retrieval capability. Data gathering is simplified, and audits by diagnosis can readily be accomplished. Traditional outpatient treatment record makes such audit laborious and expensive. |
| Detection of short- and long-term trends is necessary. Changes in incidence must be recognized in order to detect onset of epidemic. Prevalence patterns are used for health care planning. | All clinical encounters are captured, making trending accurate. Epidemiological and planning studies are possible through frequent sampling capability. | OMRIS does assist in trend detection by "browsing" individual or defined patient groups for a specific problem. Accurate data entry is crucial to this process. |
| Research and teaching must be ongoing. Provider education must be correlated with problems they are likely to encounter. Prevalence rate must be a significant factor in assigning research priorities. | Health patterns are available as indicated above. Students can rapidly retrieve cases as a preliminary to understanding and interpretation. | OMRIS can be beneficial to Family Practice Residency Program since it allows rapid linking of cases with physician. Listing of diagnoses can be used to insure equitable distribution among residents as well as providing research priorities. |
| Attempts must be made to control cost. Cost accounting of services must be made available to patients, third-party payers, and governmental agencies. Correlation of costs with outcomes is required on a continuing basis. | Automated systems are capable of preparing all standard accounting parameters and itemizing clinical services. | OMRIS billing and accounting module is not a part of FPC test system. Data regarding utilization may be used by comptroller for workload accounting. OMRIS has no interface with UCA nor is any expected as part of the test. |

Chart 3—Continued

| Health Care Specification (1) | Automated System Capability (2) | OMRIS Capability/Shortcoming (3) |
|---|---|---|
| Confidentiality and security of medical information must be assured. Use of personal data must be solely for patient's best interest while, at the same time, allowing for statistical and epidemiological studies to proceed. | Entire information system can be made secure against illegal use by unauthorized persons. | OMRIS provides for "controlled accessibility." In addition to physical security mechanisms inherent to computer operation, system provides file/record access controls restricting data access to specified users or classes of users. |

Chart 3—Continued

two will greatly enhance the system's capability. Although actual output could not be produced, formal system documentation was used to project QA capability and ultimate effect upon satisfying JCAH criteria.

The results of report/documentation and criteria analysis are summariezed in Chart 4. Column 1 represents the health care specification by which the CMRIS capability was tested. Column 2 indicates the report which was specifically produced or the system module which demonstrates the system's capability of meeting the specification. Column 3 denotes those JCAH criteria (Chart 2) which have been satisfied by the uniquely produced report or standard module. Column 4 provides comments regarding further QA upgrades which can be made during phase two or phase three of implementation. Appendices D-I show actual reports produced for this analysis. Column 2 of Chart 4 cross-references these reports to the applicable health care specification.

Since much effort was expended during this study to capitalize on CMRIS audit capability, some additional comments should be made regarding specification number four. Using a method developed by the Harvard Community Health Plan and the Massachusetts General Hospital, three approaches were considered.[8] The first called for the computer to search the entire data base and identify patients who were at risk as determined by the search parameters. Figure 2 depicts this approach. The second approach calls for the

| Health Care Specification (1) | Report Produced or Module Used (2) | JCAH Criteria Satisfied (3) | Further Enhancement in Phase 2 and 3 (4) |
|---|---|---|---|
| Comprehensive care | Status Report (Appendix A) | 1c, g; 2a-i; 5; 6a, c; 7 | Phase 2 OE/RR will provide lab and pharmacy data to status report. New format of problem list will make data more meaningful to physicians. |
| Integration of health care personnel and facilities | Diagnostic Listing (Appendix D) Status Report (Appendix A) All system modules Proposed Medication Profile (Appendix E) | 1a-c, g-h; 2a-i; 5 | Integration will occur when lab and pharmacy modules are implemented. Further integration will occur in phase 3 when another clinic is brought on-line. System allows for access by more than one provider. He, therefore, is no longer totally dependent upon manual outpatient record. |
| Alert to high-risk situations | Proposed concurrent audit using "plan sets" (Figure 4) Immunization Report (Appendix F) | 1c, i-j; 8 | Upon full implementation of phase 2, plan sets will provide unique capability to perform concurrent review automatically and report deviations. |
| Audit and evaluation | Chart audits (Appendix G) | 8 | Manual record does not readily allow for auditing by diagnosis. Phase 1 provided ability to produce pull lists by diagnosis or other parameters, making retrieval much simpler. Phase 2 will incorporate "browsing" and "plan sets," which will allow greater flexibility to retrieve specific data. |
| Detection of trends | Listing of most common diagnosis (by all diagnoses or by patient) (Appendix D) | 4a-d | Individual in charge of medical records can more readily see changes in diagnostic patterns. Full potential for trends will not |

Chart 4—Analysis of CMRIS Output to Meet JCAH Standards

| Health Care Specification (1) | Report Produced or Module Used (2) | JCAH Criteria Satisfied (3) | Further Enhancement in Phase 2 and 3 (4) |
|---|---|---|---|
| | | | be realized until phase 2 implementation. |
| Research and teaching | Chart audits (Appendix G) Diabetes Audit (Appendix G) Colon Cancer Audit (Appendix H) | Relates to QA standard and more specifically JCAH requirement for continuing education | CMRIS can be used for research and teaching beginning in phase 1. This study was conducted with phase 1 data. Potential for use in FPC Residency Program will be even greater during phase 2, when it will be possible to review meds vs. diagnosis by resident. |
| Cost control | Workload Report (Appendix I) Medication Profile (Appendix E) Scheduling Module | QA standard stresses efficient resources utilization | Although a billing and accounting module will not be part of CMRIS, "spin-off" uses exist for reports by comptroller as well as efficient uses of resources within FPC. |
| Confidentiality | NA | 3; 4a | Ad hoc report generator can be activated only by system manager. User access codes restrict terminal to specific use classification. Medical data module has restrictions for access. Such specific limitations are extremely difficult with a manual record. |

Chart 4—Continued

```
┌─────────────────────────────┐
│ Determine Risk Factors      │
│                             │
│ E.g.:   Age >16             │
│         Diastolic pres-     │
│           sure >100         │
│         Race                │
└─────────────────────────────┘
              │
              ▼
      ┌───────────────┐
      │    Screen     │
      │    Data       │
      │    Base       │
      └───────────────┘
              │
              ▼
      ┌───────────────┐
      │  Report of    │
      │  Patients     │
      │  at Risk      │
      └───────────────┘                ┌───────────────┐
              │                        │  Implicit     │
              ▼                        │  Review       │
      ┌───────────────┐◄ ─ ─ ─ ─ ─ ─ ─ └───────────────┘
      │    Review     │
      │    Records    │                ┌───────────────┐
      │               │◄ ─ ─ ─ ─ ─ ─ ─ │  Explicit     │
      └───────────────┘                │  Criteria     │
              │                        │  Audit        │
              ▼                        └───────────────┘
      ┌───────────────┐
      │  Follow-up    │
      │  of Cases     │
      │  Determined   │
      │  by Review    │
      └───────────────┘
```
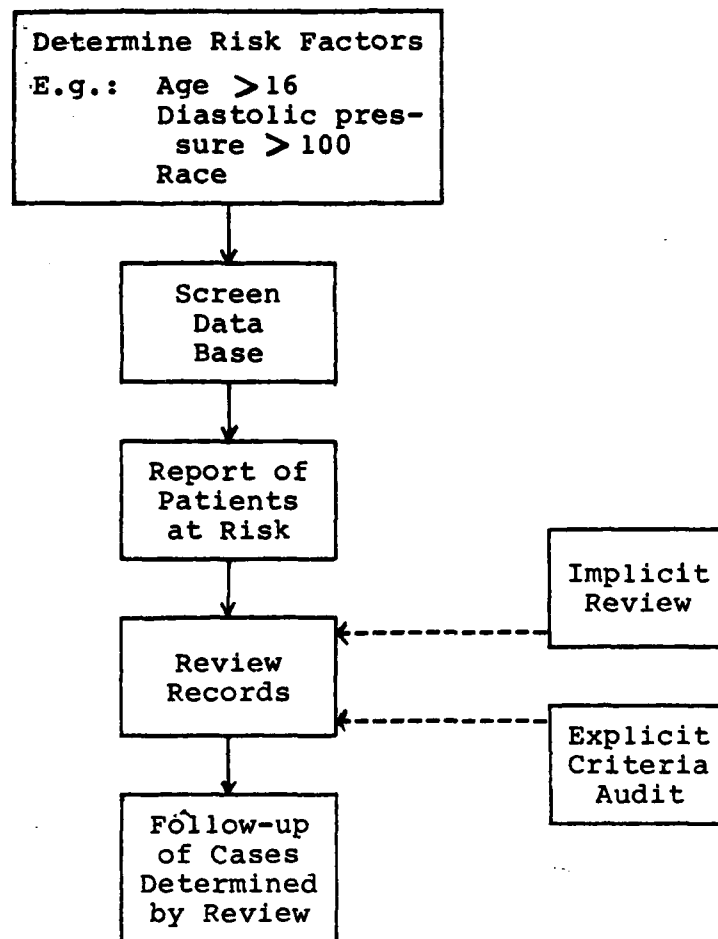
Fig. 2--Data Base Search Approach

computer to "examine" the record when the patient comes in

for a visit and flag any deviations for the provider's atten-

tion. These are corrected during that visit. Figure 3 de-

picts this second approach.

The third and by far the most exciting use of a CMRIS

calls for the computer to pick up abnormal results as they

are input, which, in turn, triggers an ongoing monitoring

process to detect deviations from prescribed standards. Such
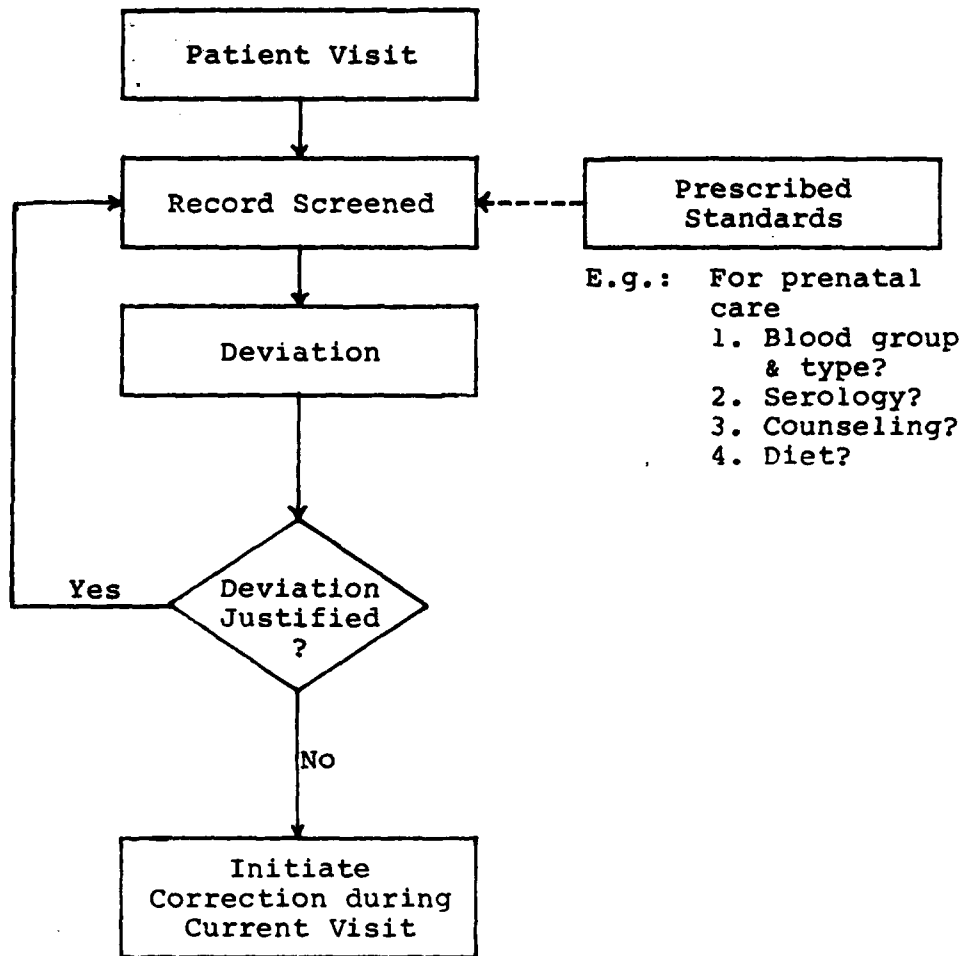
Fig. 3--Record Screening Approach

an approach represents true quality <u>assurance</u> instead of quality assessment since it identifies problems concurrently · and prompts action before a negative outcome can result.[9] Figure 4 depicts such an approach.

Unfortunately, only the first approach was demonstrable during phase one of implementation (Appendix F). Although much better than a manual search of medical records, this approach still does not provide the audit flexibility inherent
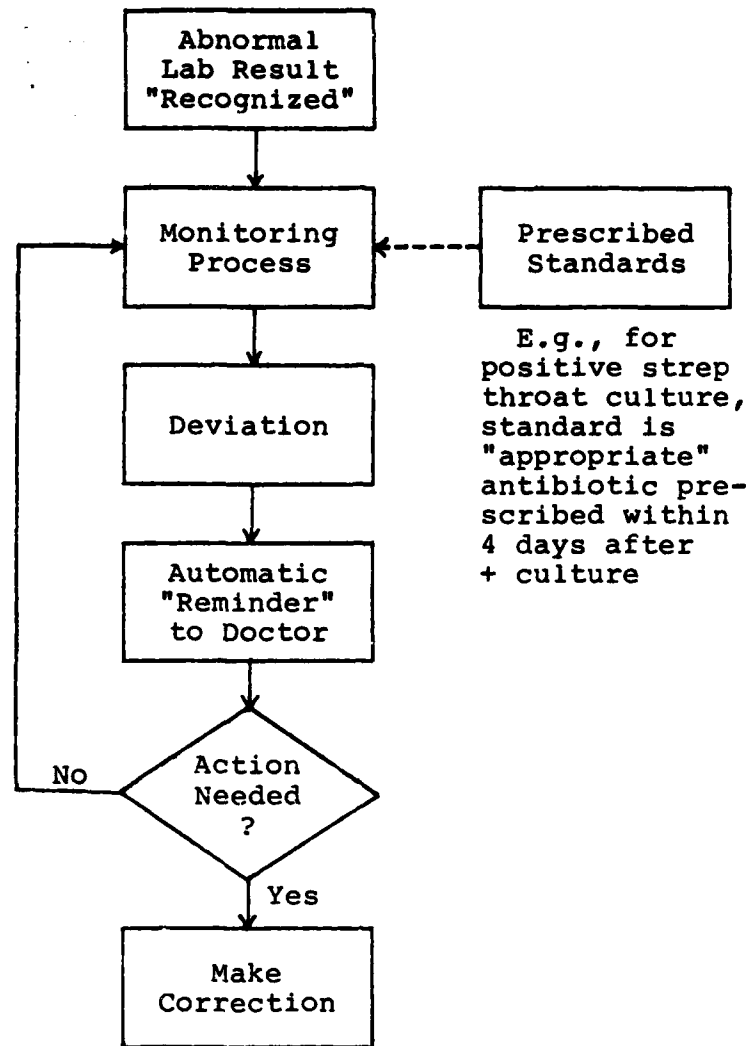
Fig. 4--Concurrent Monitoring Approach

in the other approaches. While this study did treat provider attention to CMRIS audit capability, full utilization will not be possible until phase two OE/RR is complete.

## Data Reliability

Throughout this research effort, it was readily apparent that, although interested in CMRIS QA impact, the

providers were more concerned with data reliability.[10] It
was determined, therefore, that no conclusions regarding
CMRIS quality assurance capability were appropriate without
first determining the scope of the data reliability problem.
This was done by means of a data input audit which compared
entries appearing on the encounter form with those actually
being printed on the status report. One hundred records were
randomly selected for review. The audit (shown in Appendix J)
concluded a 16.5 percent error rate was present. Results of
this audit were instrumental in bringing about changes to the
encounter form and the status report as well as numerous ad-
ministrative changes in the FPC. It is anticipated that,
prior to the implementation of phase two, these issues will
be resolved since any QA enhancements depend directly upon
good input methodology.

<div align="center">Footnotes</div>

[1]TRIMIS Program Office, Computerized Medical Record
Information System/Order Entry/Results Reporting Pilot Test,
Silas B. Hays Army Community Hospital, Ft. Ord, California,
issues meeting, Washington, D.C., March 3, 1982.

[2]National Center for Health Services Research and
Digital Equipment Corporation, Laboratory of Computer Sciences,
COSTAR: Functional Specifications (Version 5.6) (N.c.: Na-
tional Center for Health Services Research and Digital Equip-
ment Corporation, 1979), p. 3.

[3]Ibid., pp. 5-6.

[4]Ibid., pp. 7-9.

[5]Richard Winickoff, et al., A computer Based Ambula-
tory Quality Assurance Program: Final Report (Boston: Har-
vard Community Health Plan and Laboratory of Computer Science,
1979), p. v.

[6]Daniel Levinson, "Information Management in Clinical Practice," <u>The Journal of Family Practice</u> 7 (October 1978):  801-2.

[7]C. J. McDonald, "Protocol-Based Computer Reminders, the Quality of Care and the Non-Perfectibility of Man," <u>New England Journal of Medicine</u> 295 (9 December 1976):  1351; and Matthew A. Budd and P. F. Reiffen, "Implications of Computer Science for Developing Ambulatory Medical Record Systems," <u>Medical Care</u> 11 (March-April 1973):  132.

[8]Winickoff, et al., pp. 352-53.

[9]G. Octo Barnett, et al., "COSTAR--A Computer-Based Medical Information System for Ambulatory Care," <u>Proceedings of the IEEE</u> 67 (September 1979):  1236.

[10]Interview with Dr. Anthony Sforza, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California, February, 1982.

# CHAPTER III

## CONCLUSION

It is readily apparent from this partly operational and partly investigative study that the CMRIS has the potential for making major contributions to the FPC quality assurance program based upon the following:

1. The system's ability to capture, organize, index, and report both medical and administrative data can facilitate continuity of care.

2. With full implementation of phase two, the system will be able to facilitate the timely review and reporting of laboratory and pharmacy data.

3. The status report can act as a synopsis of relevant past medical treatment, providing a summary for follow-up care.

4. The patient drug profiles will offer greater medical record accuracy by showing all dispensed medications.

5. The system will assist medical records personnel in maintaining records in a predetermined, organized format.

6. The entries made by the system are always legible.

7. The system can assist in review of the quality and the appropriateness of ambulatory care by enabling the selection of cases for review by diagnosis and, under phase two, actually screening for predetermined criteria.

Although the CMRIS evaluation was able to verify the

findings stated above, a definitive conclusion regarding the improvement of quality assurance standards for ambulatory care services provided by the FPC using a CMRIS could not be drawn. The applied research question could not be answered categorically primarily because of the volatile and uncertain atmosphere that surrounded the CMRIS during much of this study. In fact, the research/operational study format was a direct result of the need to demonstrate the system's potential usefulness despite ongoing user dissatisfaction. The identification of positive system attributes may well be the most important result of this study. This is not to say that providers are now convinced that a CMRIS quality assurance program will improve clinical performance. They are, however, amenable to testing the CMRIS features in an effort to simplify existing audit requirements.[1] Even prior to the study's completion, two physicians had used the CMRIS system to identify patients needing audit.[2] Considering the system's dilemma, described previously, this constitutes a positive step toward system acceptance.

Successful implementation and proliferation of a CMRIS will not be an easy task. The SBHACH CMRIS system represents the Army's first attempt at providing the same level of data abstraction for ambulatory care that has been provided on the inpatient side since 1971. Accurately collected, such data will add a new dimension to ambulatory quality assurance as it exists today. Concurrent auditing as outlined in this

study is but one such innovative method to help achieve the ultimate goal of improved patient care.

Changes in the health care system will require some basic alterations in traditional clinical methods.[3] Clinicians will have to relinquish some individuality and adopt methods of data recording which are computer-compatible. As evidenced by the CMRIS implementation, such adaptation can present a major obstacle. Since provider acceptance is the key to system success, it is essential that the clinicians be involved with system design, system installation, and system training.[4] It is only with this level of involvement that the potential for improved patient care will be recognized without the perception of a threat to the unique clinician-patient relationship. Personalized individual and high quality medical care is possible only if service and informational systems supporting the providers are as efficient as technology can make them. When assisted by systems such as the CMRIS, routine and laborious tasks can be simplified and clinicians can more properly provide high quality care.

## Footnotes

[1]Interview with Dr. Mark E. Rampton, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California, March, 1982.

[2]Interview with Dr. Chalmers Armstrong and Dr. Jimmie Morrison, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California, March, 1982.

[3]Daniel Levinson, "Information Management in Clinical Practice," The Journal of Family Practice 7 (October 1978): 805.

[4]Ingeborg M. Kuhn and Gio Wiederhold, "The Evolution of Ambulatory Medical Record Systems in the U.S.," *Proceedings of the IEEE* 69 (January 1981): 82.

# APPENDIX A

## KEY CMRIS DOCUMENTS

# FAMILY PRACTICE CLINIC REGISTRATION FORM

Patient Initials: _____
        FML

Patient Race: A ☐ Caucasian
              B ☐ Black
              C ☐ Other
              D ☐ Unknown

## Ethnic Group:

A ☐ Spanish descent; includes all personnel of Spanish extraction except when delineated separately.

B ☐ American Indian; includes all personnel of American-Indian extraction except when delineated separately.

C ☐ Asian-American; Includes all personnel of Asian/Pacific derivation except when delineated separately.

D ☐ Puerto Rican; includes personnel born and reared in Puerto Rico.

E ☐ Filipino

F ☐ Mexican-American; includes Chicano

G ☐ Eskimo; does not include Aleut

H ☐ Aleut

I ☐ Cuban-American

J ☐ Chinese

K ☐ Japanese

L ☐ Korean

M ☐ Other than above

N ☐ Unknown

## Religious Preference:

1 ☐ Reformed
2 ☐ Roman Catholic
3 ☐ Salvation Army
4 ☐ Unitarian Universalist
5 ☐ United Church of Christ - includes Congregational Christian and Evangelical and Reformed
6 ☐ Protestant - Other Churches
7 ☐ Protestant - no denominational preference
8 ☐ Other Religions
A ☐ No religious preference
B ☐ Unknown
C ☐ Adventist, Seventh Day
D ☐ Assemblies of God
E ☐ Baptist - American Baptist Convention
F ☐ Baptist - Southern Baptist Convention
G ☐ Baptist - Other Groups
H ☐ Brethren
I ☐ Buddhism
J ☐ Christian Science
K ☐ Church of Christ
L ☐ Church of God
M ☐ Disciples of God
N ☐ Episcopal - Anglican
O ☐ Friends - Quaker
P ☐ Jehovah's Witnesses
Q ☐ Jewish
R ☐ Latter Day Saints - Mormon
S ☐ Lutheran - includes Missouri Synod
T ☐ Methodist - includes Evangelical United Brethren
U ☐ Evangelical Covenant
V ☐ Mastim
W ☐ Nazarene
X ☐ Orthodox
Y ☐ Pentecostal
Z ☐ Presbyterian

---

For Office Use Only        _____
                                Initials

Registration Date:___/___/___
                 dd mmm yy

Source: A ☐ Rotation
        B ☐ Referrals
        C ☐ Transfer
        D ☐ Educational
        E ☐ Other

Inactive Date:___/___/___
            dd mmm yy

Discharge Code: A ☐
                B ☐
                C ☐

# FAMILY PRACTICE CLINIC
## Patient History Form

Name: _____    Encounter Date: _____

Sponsor SSN _____    Provider: _____

Patient FMP: _____    _____

## Common Surgeries and Procedures

| | | | | |
|---|---|---|---|---|
| Y/RZAR2 | ☐ Abortion | | Y/NYAM6 | ☐ Femoral Bypass |
| Y/VYAS5 | ☐ Amputation | | Y/VYAA6 | ☐ Fracture Reduction |
| Y/QYAB4 | ☐ Antrectomy & Vagotomy | | Y/NYAP3 | ☐ Hemorrhoidectomy |
| Y/BYBR9 | ☐ Any Cancer Operation | | Y/QYAZ7 | ☐ Hernia Repair |
| Y/QYAR6 | ☐ Appendectomy | | Y/QYAT3 | ☐ Hiatal Hernia Repair |
| Y/NYAE5 | ☐ Arteriograph | | Y/RYAT6 | ☐ Hysterectomy |
| Y/NXAL3 | ☐ Blood Transfusion | | Y/EYAG1 | ☐ Liver Biopsy |
| Y/FYAJ1 | ☐ Bone Marrow biopsy | | Y/WYAX2 | ☐ Lumbar Puncture |
| Y/PYAB1 | ☐ Breast Biopsy | | Y/LYAC2 | ☐ Lung Resection |
| Y/LYAK3 | ☐ Bronchoscopy | | Y/PYAJ2 | ☐ Mastectomy |
| Y/MYAK6 | ☐ Cardiac Catheterization | | Y/MYAS7 | ☐ Pacemaker |
| Y/MYAA8 | ☐ Cardioversion | | Y/RXAA4 | ☐ Pelvic and/or Pap |
| Y/NXAD2 | ☐ Carotid Endarterectomy | | Y/JXAA6 | ☐ P.E. Tubes |
| Y/BYBJ8 | ☐ CAT Scan | | Y/SYAY3 | ☐ Prostatectomy |
| Y/HYAD3 | ☐ Cataract Removal | | Y/QXAH2 | ☐ Proctoscopy/Sigmoid |
| Y/QYAJ5 | ☐ Cholecystectomy | | Y/RYAJ8 | ☐ Salpingectomy |
| Y/SYAF4 | ☐ Circumcision | | Y/GYAJ4 | ☐ Skin Lesion |
| Y/QYAG8 | ☐ Colectomy | | Y/FYAR2 | ☐ Splenectomy |
| Y/MYAC5 | ☐ Coronary Bypass | | Y/JYAL7 | ☐ Tonsillectomy |
| Y/RYAL5 | ☐ C-Section | | Y/KYAS1 | ☐ Tooth Extraction |
| Y/BYBT6 | ☐ Cyst Removal | | Y/RYAR9 | ☐ Tubal Ligation |
| Y/RYAB7 | ☐ D & C | | Y/RZAJ1 | ☐ Uterine Suspension |
| Y/RXAH5 | ☐ Delivery of Baby | | Y/MYAV4 | ☐ Valve Replacement |
| Y/TXAG1 | ☐ Dialysis | | Y/SYSQ2 | ☐ Vasectomy |
| Y/BYBB7 | ☐ Endoscopy | | Y/NYAX4 | ☐ Vein Stripping |

## Common Allergies

| | | | | |
|---|---|---|---|---|
| CKNL2-C | ☐ Adverse Effect of Drugs NOS | | CKNT3-F | ☐ Narcotic Agent, HX. |
| CKNL2-D | ☐ Allergy NOS | | CKQP1 | ☐ Non Medicinal Biological |
| CKNT3-G | ☐ Analgesic Agent, HX. | | | Agents, HX. |
| CKNL2-B | ☐ Anaphylactic Shock | | CKNT5-D | ☐ Other Anti-infection Agent, HX. |
| CKNT3-E | ☐ Anesthetic Agent, HX. | | CKNT3-A | ☐ Penicillin, HX. |
| CKNT3-B | ☐ Antibiotics Agent, HX. | | JLAV3-A | ☐ Pollinic Rhinitis |
| LKNW1-L | ☐ Asthma | | CKNT3-C | ☐ Sulfonamides, HX. |
| JLAV3-1 | ☐ Hay Fever | | CKQX2 | ☐ Transfusion Reaction, HX. |
| CKNT3-J | ☐ Medicinal Agent NOS, HX. | | | |

STATUS REPORT            FMP:30  SSN: ██████████        PRINTED: 22 MAR 82

████████,JULIA J (F) 65 YRS    (12 JUL 16)
    11040 █████ ROAD ███ LOMOND,CA 95005
    HOME: 336-█████          WORK: N                    TMC: NONE


--------------------------- DIAGNOSES/PROBLEMS ---------------------------

    MHAG5-1 ECTOPIC BEATS, ALL TYPES                        18MAR82
         PUCS ON EKG NOW RESOLVED
    MHAE8   HYPERTENSION, UNCOMPLICATED           22JAN81-4-28JAN82
    GLGY3   MED OR SURG PROCEDURE WO                        20APR81
            DIAGNOSIS
    RJAB6-1 MENOPAUSAL SYMPTOMS & POST                      01OCT80
            MENO BLEED


--------------------------- ALLERGIES/SENSITIVITIES ---------------------------

    NO ALLERGIES/SENSITIVITIES


------------------ SURGERIES, PROCEDURES, AND IMMUNIZATIONS ------------------

SURGERIES
    HYSTERECTOMY [S/P 1952]                                 28JAN82


------------------------ VITAL SIGNS - LAST VISIT ------------------------

  * TEMPERATURE                     95.5        28JAN82-2-18MAR82
    WEIGHT                          151.75      28JAN82-2-18MAR82
    BLOOD PRESSURE                  138/74      28JAN82-2-18MAR82


------------------ REFERRALS AND APPOINTMENT - LAST VISIT ------------------

    NO REFERRALS AND APPOINTMENT - LAST VISIT

FAMILY PRACTICE CLINIC-PRIVACY ACT DATA

ARMSTRONG,CHALMERS,MD
26 MAR 82   1:30 PM   30M
**************************************

CACV1 TEMP_____   CAJC1 HT_____| APPOINTMENT TYPE L[ ]LATE X[ ]NO SHOW N[ ]NIGHT CALL I[ ]INAPPROPRIATE

CAKH1 WT_____   CALN1 HC_____| VISIT CLASS 1[ ]INIT  2[ ]F/U  3[ ]EMER  4[ ]PHONE  6[ ]WALK  7[ ]RENEW  9[ ]I.OB  O[ ]F/U OB

CAEF1 BP_____ |
********************************************************************************

CLINICAL NOTES:

| | | LAB TESTS |
|---|---|---|
| | T R | |
| HNCL2 | [ ][ ] | HCT |
| HNCR6 | [ ][ ] | CBC |
| HNCZ7 | [ ][ ] | DIFF |
| HNAN3 | [ ][ ] | SED. RATE |
| MPAJ7 | [ ][ ] | ANA |
| UNK | [ ][ ] | RA FACTOR |
| RNAT0 | [ ][ ] | RPR |
| JNCH9 | [ ][ ] | HBSAG |
| UNK | [ ][ ] | FOLATE AND |
| JNFJ7 | [ ][ ] | FE AND TIBC |
| NNAY5 | [ ][ ] | SICKLE CELL |
| RNBG1 | [ ][ ] | BLOOD TYPE |
| RNAX7 | [ ][ ] | ANTIBODY SCF |
| UNK | [ ][ ] | FBS |
| CNAB8 | [ ][ ] | GLUCOSE |
| UNK | [ ][ ] | NA AND K |
| CNBK7 | [ ][ ] | LYTES |
| CNAJ9 | [ ][ ] | BUN |
| CNCP5 | [ ][ ] | CREAT |
| CNEV1 | [ ][ ] | URIC ACID |
| CNDV5 | [ ][ ] | SGOT |
| CNCV9 | [ ][ ] | LDH |
| JNDH5 | [ ][ ] | CPK |
| CNBG8 | [ ][ ] | ALK. PHOS |
| CNBR6 | [ ][ ] | ACID PHOS |
| CNBT3 | [ ][ ] | BILI. T |
| CNAF2 | [ ][ ] | BILI. T&D |
| CNDC6 | [ ][ ] | GGPT |
| MPBR4 | [ ][ ] | CA++ |
| CNBZ7 | [ ][ ] | ALBUMIN |
| JNAT2 | [ ][ ] | CHOLESTEROL |
| JNCE2 | [ ][ ] | TRIGLYCERIDE |
| CNBW0 | [ ][ ] | AMYLASE |

ASSESSMENT:
********************************************************************************

| FREE TEXT DIAGNOSES | ICHPPC-2 OR COSTAR DIAGNOSES | | |
|---|---|---|---|
| | | SNAG8 [ ][ ] | T3RU, T4, FT |
| 1. _____ | 1. _____ | SNAW0 [ ][ ] | TSH |
| | | PNCL8 [ ][ ] | O&P |
| 2. _____ | 2. _____ | WNCR7 [ ][ ] | U/A |
| | | WNACO [ ][ ] | HCG(URINE) |
| 3. _____ | 3. _____ | PNEX8 [ ][ ] | URINE CULT |
| | | OTHER: | |
| 4. _____ | 4. _____ | [ ][ ] _____ | |
| | | [ ][ ] _____ | |
| 5. _____ | 5. _____ | SOURCE: _____ | |

********************************************************************************

PLAN:

| PROCEDURES DONE | | IMMUNIZATIONS | |
|---|---|---|---|
| LXAR1 [ ] ASPIRATION | | BTNC5 [ ] DPT | |
| BXAC5 [ ] COMPLETE PHYS.EXAM | | BTHX1 [ ] DT | |
| BXAV4 [ ] DRESSING CHANGE | | BTSZ1 [ ] FLU | |
| RXAC1 [ ] ENDOMETRIAL BIOPSY | | BTME2 [ ] MEASLES | |
| VXAZ3 [ ] MANIPULATION | | BTHM3 [ ] MMR | |
| BYAL9 [ ] MINOR SURGERY | | BTLR1 [ ] ORAL POLIO | |
| RXAA4 [ ] PELVIC AND/OR PAP | | BTHV4 [ ] RUBELLA | |
| QXAH2 [ ] PROCTO/SIGMOID. | | BTRT1 [ ] TB READINGS | |
| WXAT2 [ ] SPINAL TAP | | BTRB2 [ ] TINE TEST | |
| SYA02 [ ] VASECTOMY | | BTRJ3 [ ] COCCI SKIN TEST | |
| | | BTLG3 [ ] TETANUS TOXIOD | |
| OTHER: _____ | | BTTE1 [ ] PNEUMOVAX | |
| | | BTOT5 [ ] MUMPS | |

REFERRAL [ ] AACY2 _____

********************************************************************************

30 ▉▉▉▉▉▉

▉▉▉▉▉,JULIA J
12 JUL 16 F  RET USA
LTC ▉▉▉▉▉ DONALD W
11040 ▉▉▉ ROAD
▉▉▉ ▉▉▉ CA 95005
H:336-▉▉▉ W:N
FPC PT.

| FPC DISPENSED MEDS.

DOCTOR:ARMSTRONG,CHALMERS,MD LTC,MC 249-60-2504

DISPOSITION
AAC01-A_____DAYS
B_____WEEKS  [ ]ADR
C_____MONTHS (NON-SUSP)
D_____PRN
E_____ADMITTED TO HOSP.
F_____MONTHS (SUSPENSE)
********************************
ARCX7 [ ] PRECEPTOR:

APPENDIX B

CMRIS QUALITY ASSURANCE-RELATED

RECURRING REPORTS

A review of CMRIS recurring reports reveals that certain quality control mechanisms mandated by the JCAH have been addressed. For example, the coordination of a scheduling and staffing plan that facilitates accessibility and continuity is improved by routine reports from the scheduling module. Inclosures 1 thru 4 show reports generated on a routine basis, all of which are designed as management indicators in the areas of appointment types, appointment availability, and "no-show" data. As additional experience is gained with CMRIS, such reports will be valuable in accessing physicians' practice profiles.

Recurring reports shown as Inclosures 5 and 6 can also be used to capture work load as a by-product of the system rather than developing complex capture mechanisms for clinic visits and procedure data. This ultimately can mean a more equitable distribution of resources to the work center.

Daily Appointment List

FRIDAY 26 MAR 82

| | | | | |
|---|---|---|---|---|
| ....,CATHERINE | P2:00 PM | 15M(15) | FPC:BREASTCLINIC,LECLAIR TWENTYSIX MARCH | |
| | SPON: | ....,ELLIOTT V | | 30 |
| ....,PRESTON C | 9:00 AM | 60M(60) | FPC:MORRISON,JIMMIE D,MD | |
| | SPON: | ....,PRESTON C | | 20 |
| ....,JAMES D | 9:30 AM | 15M(15) | FPC:NORTON,LARRY,MD | |
| | SPON: | ....,JAMES D | | 20 |
| ....,ERIKA M | 10:00 AM | 45M(45) | FPC:SFORZA,ANTHONY,MD | |
| | SPON: | ....,JAMES R | | 30 |
| ....,ROSALIA M | 8:00 AM | 15M(15) | FPC:MORRISON,JIMMIE D,MD | |
| | SPON: | ....,ISIDRO S | | 30 |
| ....,MARCIA | 1:30 PM | 15M(15) | FPC:BREASTCLINIC,LECLAIR TWENTYSIX MARCH | |
| | SPON: | ....,ANTHONY | | 1830 |
| ....,PAUL W | 9:15 AM | 15M(15) | FPC:SFORZA,ANTHONY,MD | |
| | SPON: | ....,PAUL W | | 20 |
| ....,JANICE B | 1:15 PM | 15M(15) | FPC:SARGENT,DAVID,DO | |
| | SPON: | ....,MALCOLM D | | 30 |
| ....,MALCOLM D | 1:00 PM | 15M(15) | FPC:SARGENT,DAVID,DO | |
| | SPON: | ....,MALCOLM D | | 20 |
| ....,FLORENCE S | 8:00 AM | 15M(15) | FPC:SFORZA,ANTHONY,MD | |
| | SPON: | ....,RAYMOND W | | 30 |
| ....,ANNETTE BRSC | 3:00 PM | 15M(15) | FPC:BREASTCLINIC,LECLAIR TWENTYSIX MARCH | |
| | SPON: | ....,KENNETH | | 1830 |
| ....,JOELLEN | 3:00 PM | 15M(15) | FPC:MELI,JAMES,DO | |
| | SPON: | ....,JOELLEN | | 20 |
| ....,BIRGIT H | 10:00 AM | 15M(15) | FPC:ARMSTRONG,CHALMERS,MD | |
| | SPON: | ....,BRUCE W | | 30 |
| ....,URSULA BR CL | 1:15 PM | 15M(15) | FPC:BREASTCLINIC,LECLAIR TWENTYSIX MARCH | |
| | SPON: | ....,ANSELMO | | 1830 |
| ....,MARIE T | 1:45 PM | 15M(15) | FPC:BOYD,JOHN,MD | |
| | SPON: | ....,RESE C | | 02 |
| ....,FELICISIMO C | 8:15 AM | 15M(15) | FPC:ZARINCZUK,JAMES,MD | |
| | SPON: | ....,FELICISIMO C | | 20 |
| ....,PHILOMENA E | 1:00 PM | 15M(15) | FPC:BOYD,JOHN,MD | |
| | SPON: | ....,ORLANDO A | | 30 |
| ....,JEREMY V | 8:15 AM | 30M(30) | FPC:MORRISON,JIMMIE D,MD | |
| | SPON: | ....,LARRY G | | 01 |
| ....,MICHAEL | 2:45 PM | 15M(15) | FPC:SARGENT,DAVID,DO | |
| | SPON: | ....,RAY L | | 01 |
| ....,MARY K | 1:45 PM | 15M(15) | FPC:SARGENT,DAVID,DO | |
| | SPON: | ....,MICHAEL D | | 01 |
| ....,MARY ELLEN | 1:00 PM | 30M(30) | FPC:ZIMBER,JAMES,MD | |
| | SPON: | ....,GEORGE M | | A1 |

/15-MINUTE SLOTS FOR ZARINCZUK,JAMES,MD\

```
            ! 7AM! 8AM! 9AM!10AM!11AM!12PM! 1PM! 2PM! 3PM! 4PM! 5PM! 6PM!
23 MAR 82 !----!::::::!::::::!::::!::::!::::!::::!::::!::::!::::!::--!----!----!
24 MAR 82 !----!:::::!1111!1W**!****!****!2111!1111!1W1*!**--!----!----!
25 MAR 82 !----!1111!1111!1W**!****!****!11:::!:::::!:::*!**--!----!----!
26 MAR 82 !----!2111!1111!1W**!****!****!:::::!:::::!:::*!**--!----!----!
29 MAR 82 !----!:::::!:::::!:::**!****!****!:::::!:::::!:::*!**--!----!----!
30 MAR 82 !----!:::::!:::::!:::**!****!****!:::::!:::::!:::*!**--!----!----!
31 MAR 82 !----!:::::!:::::!:::**!****!****!:::::!:::::!:::*!**--!----!----!
```

## TABLE OF APPT. TYPES
### FAMILY PRACTICE CLINIC  01 MAR 82-23 MAR 82

| VBDAT | ROUTINE | INAPPROPRIATE | TYPE | LATE | NIGHT CALL | NO SHOW | TOTAL |
|---|---|---|---|---|---|---|---|
| 01 MAR 82 | 189 | 0 | 0 | 0 | 0 | 4 | 193 |
| 02 MAR 82 | 161 | | | | 0 | 2 | 163 |
| 03 MAR 82 | 121 | | | | 0 | 2 | 124 |
| 04 MAR 82 | 154 | | | | 0 | 2 | 158 |
| 05 MAR 82 | 127 | 0 | 0 | 0 | 0 | 4 | 131 |
| 08 MAR 82 | 144 | | | | 0 | 10 | 174 |
| 09 MAR 82 | 172 | | | | 0 | 3 | 175 |
| 10 MAR 82 | 111 | 0 | 0 | 0 | 0 | 2 | 113 |
| 11 MAR 82 | 159 | | | | 0 | 7 | 166 |
| 12 MAR 82 | 141 | | | | 0 | 1 | 142 |
| 13 MAR 82 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 14 MAR 82 | 1 | | | | 0 | 0 | 1 |
| 15 MAR 82 | 183 | | | | 0 | 3 | 186 |
| 16 MAR 82 | 145 | 0 | 0 | 0 | 0 | 1 | 149 |
| 17 MAR 82 | 137 | | | | 0 | 6 | 143 |
| 18 MAR 82 | 124 | 0 | 0 | 1 | 0 | 7 | 131 |
| 19 MAR 82 | 106 | | | | 0 | 4 | 113 |
| 20 MAR 82 | 8 | 0 | 0 | 0 | 0 | 0 | 8 |
| 22 MAR 82 | 83 | | | | 0 | 0 | 83 |
| 23 MAR 82 | 37 | 0 | 0 | 0 | 0 | 0 | 37 |
| TOTAL | 2323 | 0 | 0 | 2 | 0 | 62 | 2387 |

TABLE OF APPT. CLASS
FAMILY PRACTICE CLINIC   01 MAR 82-23 MAR 82

| VDAT | EMERGENCY | FOLLOW UP | INITIAL | INPATIENT | UCLABS PHONE CALL | RENEW | WALK IN | OTHER | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| 01 MAR 82 | 0 | 63 | 64 | 0 | 49 | 0 | 7 | 10 | 193 |
| 02 MAR 82 | 1 | 53 | 41 | 0 | 31 | 0 | 2 | 36 | 163 |
| 03 MAR 82 | 0 | 29 | 47 | 0 | 33 | 0 | 2 | 13 | 124 |
| 04 MAR 82 | 0 | 37 | 46 | 0 | 32 | 0 | 1 | 22 | 158 |
| 05 MAR 82 | 0 | 31 | 54 | 0 | 29 | 0 | 7 | 10 | 131 |
| 08 MAR 82 | 0 | 60 | 56 | 0 | 41 | 0 | 2 | 15 | 174 |
| 09 MAR 82 | 1 | 49 | 57 | 0 | 35 | 0 | 0 | 23 | 175 |
| 10 MAR 82 | 0 | 38 | 35 | 0 | 31 | 0 | 0 | 8 | 113 |
| 11 MAR 82 | 0 | 45 | 50 | 0 | 34 | 0 | 10 | 25 | 164 |
| 12 MAR 82 | 0 | 46 | 53 | 0 | 31 | 0 | 1 | 11 | 142 |
| 13 MAR 82 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 2 |
| 15 MAR 82 | 0 | 64 | 50 | 0 | 53 | 0 | 2 | 17 | 186 |
| 16 MAR 82 | 0 | 55 | 28 | 0 | 35 | 0 | 0 | 28 | 146 |
| 17 MAR 82 | 0 | 47 | 41 | 0 | 31 | 0 | 2 | 22 | 143 |
| 18 MAR 82 | 0 | 57 | 47 | 0 | 7 | 0 | 1 | 18 | 131 |
| 19 MAR 82 | 0 | 40 | 39 | 0 | 22 | 0 | 0 | 11 | 112 |
| 20 MAR 82 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 |
| 22 MAR 82 | 0 | 28 | 18 | 0 | 28 | 0 | 0 | 9 | 83 |
| 23 MAR 82 | 0 | 14 | 8 | 0 | 1 | 0 | 0 | 16 | 39 |
| TOTAL | 2 | 758 | 755 | 0 | 531 | 0 | 39 | 302 | 2387 |

61

FPC WORKLOAD REPORT

TUMBLESON,SHIRLEY   01 MAR 82-23 MAR 82

VCLASS

| VDAT | PHONE CALL | OTHER | TOTAL |
|---|---|---|---|
| 01 MAR 82 | 25 | 9 | 34 |
| 02 MAR 82 | 16 | 7 | 23 |
| 03 MAR 82 | 13 | 4 | 17 |
| 04 MAR 82 | 9 | 10 | 19 |
| 05 MAR 82 | 18 | 12 | 30 |
| 08 MAR 82 | 19 | 7 | 26 |
| 09 MAR 82 | 17 | 25 | 42 |
| 10 MAR 82 | 19 | 7 | 26 |
| 11 MAR 82 | 24 | 23 | 47 |
| 12 MAR 82 | 13 | 7 | 20 |
| 13 MAR 82 | 0 | 0 | 0 |
| 14 MAR 82 | 19 | 12 | 31 |
| 15 MAR 82 | 20 | 4 | 24 |
| 17 MAR 82 | 10 | 4 | 14 |
| 18 MAR 82 | 0 | 7 | 7 |
| 19 MAR 82 | 10 | 2 | 12 |
| 20 MAR 82 | 0 | 0 | 0 |
| 22 MAR 82 | 14 | 2 | 18 |
| 23 MAR 82 | 0 | 0 | 0 |
| TOTAL | 248 | 142 | 390 |

62

TOTAL   01 MAR 82-23 MAR 82

| PRO | TOTAL |
|---|---|
| DRESSING CHANGE | 18 |
| CYST REMOVAL | 2 |
| SUTURE REMOVAL | 3 |
| EAR IRRIGATION | 0 |
| PROCTOSCOPY OR SIGMOIDOSC | 5 |
| PELVIC EXAMINATION AND OR | 34 |
| VASECTOMY | 8 |
| TOTAL | 72 |

63

APPENDIX C

AD HOC REPORT GENERATOR

TEST REPORTS

ROSTER AND SELECTED PATIENT DATA FOR DR. ████
06 APR 82

| NAME | FMP | SFON SSN | AGE | HOME TELEPHONE | WORK TELEPHONE | ADDRESS | CITY AND STATE |
|---|---|---|---|---|---|---|---|
| ████ KAREN I | 01 | ████ | 7 | 394-████ | 242-████ | 309 ████ RD | FT ORD,C |
| ████ KATERINA J | 03 | ████ | 3 | 394-████ | 242-████ | 309 ████ RD | MARINA,C |
| ████ SHEREEN | 04 | ████ | 3 | 394-████ | 624-████ | 309 ████ RD | MARINA,C |
| ████ ANNETTE M | 30 | ████ | 22 | 384-████ | 242-████ | 837 ████ CIR | |
| ████ BERNELL B | 30 | ████ | 18 | N | 242-████ | 3306 ████ APT ███ | MARINA,C |
| ████ CERVANTES E | 20 | ████ | 22 | N | 242-████ | 3306 ████ APT ███ | MARINA,C |
| ████ MONDOE R | 01 | ████ | 0 | N | 242-████ | 3306 ████ APT ███ | |
| ████ MILLIE E | 20 | ████ | 24 | 384-████ | 242-████ | 837 ████ CIR | FT ORD,C |
| ████ ESPERANZA | 50 | ████ | 38 | 899-████ | N | 1774 ████ ST | SEASIDE, |
| ████ ELIZABETH A | 30 | ████ | 38 | 899-████ | 242-████ | 325 ████ ROAD | FT ORD,C |
| ████ KATHLEEN M | 03 | ████ | 3 | 899-████ | 242-████ | 325 ████ ROAD | FT ORD,C |
| ████ MICHAEL A | 02 | ████ | 11 | 899-████ | 242-████ | 325 ████ ROAD | FT ORD,C |
| ████ PAUL E | 20 | ████ | 36 | 899-████ | 242-████ | 325 ████ ROAD | FT ORD,C |
| ████ SHARON A | 01 | ████ | 15 | 899-████ | 242-████ | 325 ████ ROAD | FT ORD,C |
| ████ JOHN E | 20 | ████ | 63 | 625-████ | N | 27460 ████ | CARMEL,C |
| ████ LORETTA M | 30 | ████ | 61 | 625-████ | N | 27460 ████ | CARMEL,C |
| ████ DELINDA K | 02 | ████ | 12 | 384-████ | 242-████ | 3064 ████ DRIVE | |
| ████ HELEN J | 30 | ████ | 38 | 384-████ | 242-████ | 3064 ████ DRIVE | MARINA,C |
| ████ RODOLFO M | 20 | ████ | 17 | 384-████ | 242-████ | 3064 ████ DRIVE | |
| ████ BRENDA K | 30 | ████ | 45 | 384-████ | 242-████ | 341 ████ COURT | FORT ORD |
| ████ STEVEN F | 20 | ████ | 22 | 384-████ | 242-████ | 341 ████ COURT | |
| ████ TANYA M | 01 | ████ | 27 | 384-████ | 242-████ | 341 ████ COURT | |
| ████ GINA | 30 | ████ | 0 | 384-████ | N | 3306 ████ BLVD | MARINA,C |
| ████ HERBERT L | 20 | ████ | 21 | 384-████ | N | 3306 ████ BLVD | MARINA,C |
| ████ CHARITO L | 30 | ████ | 22 | 899-████ | N | 1700 ████ STREET | SEABIDE, |
| ████ JMEANNIFER | 01 | ████ | 26 | 899-████ | N | 1700 ████ STREET | SEABIDE, |
| ████ KARL D | 02 | ████ | 3 | 633-████ | 242-████ | 15395 ████ BLVD | SALINAS, |
| ████ KENNETH M | 30 | ████ | 15 | 633-████ | 242-████ | 15395 ████ BLVD | SALINAS, |
| ████ LORNA R | 30 | ████ | 45 | 633-████ | 242-████ | 15395 ████ BLVD | SALINAS, |
| ████ JINEZ A | 01 | ████ | 42 | 375-████ | 242-████ | 7 ████ APT ███ | PACIFIC |
| ████ JOHNNIE M | 20 | ████ | 31 | 375-████ | 242-████ | 2 ████ APT ███ | |
| ████ DEBRA A | 30 | ████ | 22 | 394-████ | 242-████ | 204 ████ ST | FORT ORD |
| ████ MICHAEL S | 01 | ████ | 2 | 394-████ | 242-████ | 204 ████ ST | |
| ████ ROGER K | 20 | ████ | 23 | 394-████ | 242-████ | 204 ████ ST | FORT ORD |
| ████ TABHINA R | 02 | ████ | 0 | 394-████ | 242-████ | 204 ████ ST | |
| ████ ALYSSA B | 03 | ████ | 1 | 394-████ | 242-████ | 315 ████ ROAD | FORT ORD |
| ████ COREY A | 02 | ████ | 4 | 394-████ | 242-████ | 315 ████ ROAD | FORT ORD |
| ████ KATHERINE R | 30 | ████ | 26 | 394-████ | 242-████ | 315 ████ ROAD | FORT ORD |
| ████ PATRICK T | 01 | ████ | 4 | 394-████ | 242-████ | 315 ████ ROAD | FORT ORD |
| ████ TIMOTHY P | 20 | ████ | 28 | 394-████ | 242-████ | 315 ████ ROAD | MARINA,C |
| ████ FRED D | 01 | ████ | 35 | 384-████ | N | 2140 ████ AVENUE APT ◆ | |
| ████ MARIA B | 30 | ████ | 9 | 447-████ | N | 2140 ████ AVENUE APT ◆ | |
| ████ MARIE SUZANE | 20 | ████ | 58 | 447-████ | N | 1827 ████ WY | SALINAS, |
| ████ WILLIAM M | 30 | ████ | 57 | 384-████ | N | 1827 ████ WY | SALINAS, |
| ████ GARY J | 01 | ████ | 32 | 384-████ | N | 3005 ████ ST | MARINA,C |
| ████ JONNIE M | 30 | ████ | 6 | 384-████ | 242-████ | 117 ████ CIRCLE | FORT ORD |
| ████ KRISBY M | 02 | ████ | 25 | 384-████ | 242-████ | 117 ████ CIRCLE | FORT ORD |
| ████ ANNETTE | 20 | ████ | 4 | 384-████ | 242-████ | 117 ████ CIRCLE | FORT ORD |
| ████ CHAUNCEY B | 01 | ████ | 25 | N | 242-████ | 3128 ████ STREET APT ◆ | MARINA,C |
| ████ JERRY W | 20 | ████ | 3 | 384-████ | 242-████ | MMT ████ AIR CND | FORT ORD |
| ████ KATINA TIWANA | 02 | ████ | 27 | 384-████ | 242-████ | 3128 ████ STREET APT ◆ | MARINA,C |
| ████ CANDACE E | 30 | ████ | 0 | 384-████ | 242-████ | 3128 ████ STREET APT ◆ | |
| ████ DANIELLE R | 30 | ████ | 27 | 384-████ | 242-████ | 184 ████ AVE ◆ | MARINA,C |
| ████ DUANE R | 20 | ████ | 26 | 384-████ | 242-████ | 407 ████ CIRCLE | FORT ORD |
| | | | | | | 184 ████ AVE ◆ | MARINA,C |

TABLE OF APPT, CLASS
TOTAL 06 APR 82

66

| VDAT | EMERGENCY | FOLLOW UP | INITIAL | INPATIENT | VCLASS PHONE CALL | RENEWAL | WALK IN | OTHER | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| 01 MAR 82 | 0 | 63 | 66 | 0 | 49 | 0 | 7 | 10 | 195 |
| 02 MAR 82 | 1 | 54 | 42 | 0 | 31 | 0 | 2 | 28 | 165 |
| 03 MAR 82 | 0 | 29 | 49 | 0 | 34 | 0 | 2 | 13 | 127 |
| 04 MAR 82 | 0 | 38 | 44 | 0 | 32 | 15 | 7 | 10 | 159 |
| 05 MAR 82 | 0 | 31 | 54 | 0 | 29 | 0 | 2 | 15 | 131 |
| 08 MAR 82 | 0 | 41 | 56 | 0 | 41 | 2 | 0 | 21 | 178 |
| 09 MAR 82 | 1 | 51 | 58 | 0 | 35 | 12 | 0 | 8 | 173 |
| 10 MAR 82 | 0 | 38 | 35 | 0 | 31 | 4 | 10 | 19 | 113 |
| 11 MAR 82 | 0 | 45 | 50 | 0 | 37 | 0 | 0 | 11 | 167 |
| 12 MAR 82 | 0 | 47 | 54 | 0 | 32 | 0 | 0 | 0 | 145 |
| 13 MAR 82 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| 14 MAR 82 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 15 | |
| 15 MAR 82 | 0 | 65 | 50 | 0 | 53 | 1 | 0 | 22 | 187 |
| 16 MAR 82 | 0 | 56 | 28 | 0 | 35 | 1 | 0 | 21 | 147 |
| 17 MAR 82 | 0 | 51 | 46 | 0 | 32 | 0 | 1 | 15 | 151 |
| 18 MAR 82 | 0 | 71 | 54 | 0 | 30 | 0 | 0 | 11 | 177 |
| 19 MAR 82 | 0 | 53 | 43 | 0 | 26 | 0 | 2 | 11 | 134 |
| 20 MAR 82 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 MAR 82 | 0 | 59 | 45 | 0 | 31 | 7 | 2 | 10 | 147 |
| 23 MAR 82 | 1 | 51 | 43 | 0 | 18 | 0 | 3 | 15 | 134 |
| 24 MAR 82 | 0 | 44 | 61 | 0 | 27 | 0 | 0 | 12 | 148 |
| 25 MAR 82 | 1 | 41 | 50 | 0 | 21 | 0 | 1 | 11 | 130 |
| 26 MAR 82 | 0 | 67 | 54 | 1 | 19 | 0 | 1 | 14 | 158 |
| 29 MAR 82 | 0 | 71 | 48 | 0 | 40 | 0 | 0 | 13 | 172 |
| 30 MAR 82 | 0 | 43 | 39 | 0 | 27 | 5 | 2 | 22 | 136 |
| 31 MAR 82 | 0 | 30 | 32 | 0 | 7 | | | 11 | 82 |
| TOTAL | 4 | 1159 | 1124 | 1 | 727 | 74 | 48 | 332 | 3467 |

NURSE WORKLOAD REPORT
04 MAR 82  06 APR 82

| UNNAM | TUMBLESON,SHIRLEY | KILIAN,CHERYL | PROVIDER1 CORPS/PERSON | SHAW,PHYLLIS | TOTAL |
|---|---|---|---|---|---|
| ,JENNIFER L | | 1 | 1 | | 2 |
| ,PRESTON C | | 1 | 1 | | 2 |
| ,FRED M | 1 | | 1 | | |
| BETTY J | | | 1 | | |
| ,STEPHEN J | 1 | | | | |
| ,KRISTIN K | | 1 | 1 | | |
| ,DOROTHY | 1 | | | | |
| ,JERI K | | | | | |
| ,JACOB E | | | | | |
| BILLY J | | | | | |
| ,JENNIFER EL | | | | | |
| ,AUBREY A | 1 | 1 | 1 | | |
| ,IKE JR | 1 | | | | |
| ,J GARETT | | 1 | 1 | 1 | |
| ,SHEILA L | 1 | 1 | | | |
| ,JENNIFER L | | | | | |
| ,CARLA | | | | | |
| ,CLYDE | | | | | |
| ,HAZEL | | 1 | | | |
| ,ROBERT | | | | | |
| ,DOROTHY D | 1 | 1 | | | |
| ,MARIE M | | | | | |
| ,CURTIS | 1 | 1 | | | |
| ,KERI L | | | | | |
| ,ALICE L | | | | | |
| ,EDWARD M | 1 | 1 | 1 | | |
| ,PATRICIA | | | | | |
| ,MARY E | | | | | |
| ,JESSIE C | 1 | | | | |
| ,YANG S | 1 | 1 | | | |
| ,BLAND W | | | 1 | | |
| ,MATTHEW R | | | | | |
| ,ANDREW U | | | | | |
| ,CHARLES J | 1 | 1 | 1 | | |
| ,CHRISTINE | | | | | |
| ,STANLEY D | | 1 | 1 | | |
| ,CHRISTINE E | | | | | |
| ,BRENDA | 1 | 1 | 1 | | |
| ,ESPERANZA G | | | | | |
| ,SUSAN | 1 | | | | |
| ,JENNIFER LEI | | 1 | | | |
| ,JOE A | | | | | |
| ,MARY T | 1 | 1 | 1 | | |
| ,KRISTAINA D | | | | | |
| ,MICHELLE | | 1 | | | |
| ,VELMA A | | 1 | | | |
| ,WESLEY III | | | | | |
| ,CORY N | | | | | |
| ,BRANDY M | | | 1 | | |
| ,SHELLEY L | | | | | |
| ,PATRICK | | | | | |
| ,MICHAEL J | | | | | |
| TOTAL | 19 | 23 | 11 | 1 | 54 |

DIABETES AUDIT PANEL        PAGE 1
06 APR 82

| NAME | FMP | SPON SSN | DOCTOR | HOME TELEPHONE | BIRTHDATE | AGE | DATE |
|------|-----|----------|--------|----------------|-----------|-----|------|
| SAMUEL F | 20 | ███████ | MORRISON,JIMMIE D,MD | 449-████ | 18 JUL 28 | 53 | 24 OCT 80 |
| LILLIAN V | 30 | ███████ | MORRISON,JIMMIE D,MD | 633-████ | 10 NOV 18 | 63 | 20 APR 81 |
| JEWELL L | 30 | ███████ | MORRISON,JIMMIE D,MD | 424-████ | 30 APR 19 | 62 | 21 AUG 80 |
| DOROTEA L | 50 | ███████ | MORRISON,JIMMIE D,MD | 394-████ | 07 FEB 00 | 82 | 22 MAY 80 |
| ROBERT D | 20 | ███████ | ARMSTRONG,CHALMERS.M | 484-████ | 23 AUG 20 | 61 | 09 DEC 81 |
| KIYOMO | 30 | ███████ | MORRISON,JIMMIE D,MD | 449-████ | 22 OCT 36 | 45 | 17 DEC 81 |
| ,BLUMIE | 30 | ███████ | MORRISON,JIMMIE D,MD | 394-████ | 14 JUL 19 | 62 | 02 JUL 81 |
| ,BETTY L | 30 | ███████ | MORRISON,JIMMIE D,MD | 449-████ | 02 APR 42 | 40 | 24 MAR 81 |
| ,ROBERT L | 20 | ███████ | MORRISON,JIMMIE D,MD | 449-████ | 30 AUG 26 | 55 | 03 NOV 80 |
| BILLIE J | 30 | ███████ | MORRISON,JIMMIE D,MD | 394-████ | 31 AUG 62 | 19 | 18 DEC 81 |

APPENDIX D

DIAGNOSTIC LISTING

The diagnostic listing represents the first attempt by the ad hoc report generator to produce a listing of all diagnoses in their order of frequency. In addition, each diagnosis was also listed by the percentage it constituted among all diagnoses. Only the first page of each rank order method is shown. However, over three hundred diagnoses were ranked by both frequency and percentage.

The generation of this report indicates the system's capability to search large quantities of data and make retrievals in heretofore, impossible formats. The use of such a report for research and teaching is far reaching. For example, it can be used to assure equal distribution of cases by complexity to residents. Moreover, it can be applied to studies dealing with short and long term trending.

DX

| DX | TOTAL |
|---|---|
| ADVICE & HEALTH INSTRUCTI | 667 |
| HYPERTENSION, UNCOMPLICAT | 629 |
| PRENATAL CARE | 552 |
| MEDICAL EXAM | 463 |
| ACUTE UPPER RESPIR TRACT | 409 |
| LETTER, FORMS, PRESCRIPTI | 399 |
| DMA3NAME | 211 |
| DIABETES MELLITUS WO COMP | 209 |
| GENERALIZED OSTEOARTHROSI | 142 |
| CHRONIC ISCHEMIC HEART DI | 140 |
| ACUTE OTITIS MEDIA | 131 |
| TGA2NAME | 128 |
| BACK PAIN WO RADIATING SY | 117 |
| BHN3NAME | 116 |
| QLA1NAME | 108 |
| MED OR SURG PROCEDURE WO | 103 |
| ASTHMA, EXTRINSIC | 98 |
| BRONCHITIS & BRONCHIOLITI | 95 |
| CHEST PAIN | 95 |
| OTHER SKIN & SUBCUTANE TI | 88 |
| PAIN & OTHER LIMB SYMPTOM | 85 |
| PAIN OR STIFFNESS IN JOIN | 81 |
| PNEUMONIA | 80 |
| PROPHYLACTIC IMMUNIZATION | 78 |
| RJA4NAME | 71 |
| GHA3NAME | 69 |
| CYSTITIS & URINARY INFECT | 63 |
| HYPERTENSION INVOLVING TA | 59 |
| CONTACT & OTHER DERMATITI | 58 |
| RASH & OTHER NONSPECIFIC | 57 |
| STREP THROAT, SCARLET FEV | 55 |
| YJA6NAME | 52 |
| ACUTE & CHRON SEROUS OTIT | 51 |
| SINUSITIS, ACUTE & CHRONI | 50 |
| DEPRESSIVE DISORDER | 48 |
| EMPHYSEMA & COPD | 42 |
| JLA3NAME | 38 |
| VJA2NAME | 37 |
| OTITIS EXTERNA | 36 |
| HEADACHE | 36 |
| ABNORMAL UNEXPLAINED BIOC | 34 |
| RJA6NAME | 34 |
| ALLERGIES | 33 |
| MLB3NAME | 29 |
| OTHER EYE DISEASES | 29 |
| HYPOTHYROIDISM, MYXEDEMA, | 28 |
| OTHER BURSITIS & SYNOVITI | 28 |
| PJA1NAME | 26 |
| OTHER MUSCULOSKEL, CONNEC | 25 |
| CONJUNCTIVITIS & OPHTHALM | 25 |
| QLB4NAME | 24 |
| ALCOHOL ABUSE & ALCOHOLIC | 24 |
| DIZZINESS & GIDDINESS | 23 |
| MJB4NAME | 23 |
| FLA5NAME | 23 |

DX

| | TOTAL |
|---|---|
| DKN5NAME | 22 |
| QHA2NAME | 22 |
| PHA1NAME | 22 |
| PALPITATIONS | 21 |
| IRRIT BOWEL SYNDR OR INTE | 21 |
| HX OF ALLERGY TO MEDICINA | 20 |
| MALIG NEOPL GASTROINTESTI | 20 |
| ACNE | 20 |
| OTHER ADVERSE EFFECTS NEC | 19 |
| DERMATOPHYTOSIS & DERMATO | 19 |
| DIVERTICULA OF INTESTINE | 19 |
| OTHER RESPIRATORY SYSTEM | 19 |
| DEAFNESS, PARTIAL OR COMP | 18 |
| JHA2NAME | 18 |
| PRESUMED INFECTIOUS INTES | 18 |
| OTHER NERVOUS SYSTEM DISE | 18 |
| QHA1NAME | 18 |
| CKN2NAME | 17 |
| SHOULDER SYNDROMES | 17 |
| BRUISE, CONTUSION, CRUSHI | 17 |
| OTHER EAR & MASTOID DISEA | 17 |
| HYPRPLASIA PROSTAT | 16 |
| WHA8NAME | 16 |
| QGA1NAME | 16 |
| DIAGNOSING PREGNANCY | 16 |
| YKA3NAME | 16 |
| OTHER HEART DISEASES NEC | 16 |
| DIAPER RASH | 16 |
| OTHER ENDOCR, NUTRITN, ME | 15 |
| OTHER FEMALE GENITAL ORGA | 15 |
| JJA1NAME | 15 |
| GLA2NAME | 14 |
| TUBERCULOSIS | 14 |
| OTHER URINARY SYSTEM DISE | 14 |
| SIGN, SYMPTOM, ILL DEFINE | 14 |
| MARITAL PROBLEM | 14 |
| RHEUMATOID ARTHRIT & ALLI | 14 |
| FEVER OF UNDETERMINED CAU | 13 |
| TJA4NAME | 13 |
| SPRAIN OR STRAIN ANKLE | 13 |
| ARTHRITIS NEC OR DIFF CON | 13 |
| BOIL & CELLULITIS INCL FI | 13 |
| POLYDRUG ABUSE | 12 |
| IMPETIGO | 12 |
| HIATUS OR DIAPHRAGMATIC H | 12 |
| NONTOXIC GOITER & NODULE | 12 |
| VLE6NAME | 12 |
| REFERRAL WO EXAM OR INTER | 12 |
| STERILITY & REDUCED FERTI | 12 |
| CLB2NAME | 11 |
| MHA5NAME | 11 |
| OTHER INFECTIONS SKIN OR | 11 |
| OTHER PEPTIC ULCER | 11 |
| BHV1NAME | 11 |
| PHLEBITIS & THROMBOPHLEBI | 11 |

% TOTAL                          08 MAR 82

DX

| | TOTAL |
|---|---|
| ADVICE & HEALTH INSTRUCTI | 8.1 |
| HYPERTENSION, UNCOMPLICAT | 7.7 |
| PRENATAL CARE | 6.7 |
| MEDICAL EXAM | 5.6 |
| ACUTE UPPER RESPIR TRACT | 5.0 |
| LETTER, FORMS, PRESCRIPTI | 4.9 |
| DMA3NAME | 2.6 |
| DIABETES MELLITUS WO COMP | 2.6 |
| GENERALIZED OSTEOARTHROSI | 1.7 |
| CHRONIC ISCHEMIC HEART DI | 1.7 |
| ACUTE OTITIS MEDIA | 1.6 |
| TGA2NAME | 1.6 |
| BACK PAIN WO RADIATING SY | 1.4 |
| BHN3NAME | 1.4 |
| QLA1NAME | 1.3 |
| MED OR SURG PROCEDURE WO | 1.3 |
| ASTHMA, EXTRINSIC | 1.2 |
| BRONCHITIS & BRONCHIOLITI | 1.2 |
| CHEST PAIN | 1.2 |
| OTHER SKIN & SUBCUTANE TI | 1.1 |
| PAIN & OTHER LIMB SYMPTOM | 1.0 |
| PAIN OR STIFFNESS IN JOIN | 1.0 |
| PNEUMONIA | 1.0 |
| PROPHYLACTIC IMMUNIZATION | 1.0 |
| RJA4NAME | 0.9 |
| GHA3NAME | 0.8 |
| CYSTITIS & URINARY INFECT | 0.8 |
| HYPERTENSION INVOLVING TA | 0.7 |
| CONTACT & OTHER DERMATITI | 0.7 |
| RASH & OTHER NONSPECIFIC | 0.7 |
| STREP THROAT, SCARLET FEV | 0.7 |
| YJA6NAME | 0.6 |
| ACUTE & CHRON SEROUS OTIT | 0.6 |
| SINUSITIS, ACUTE & CHRONI | 0.6 |
| DEPRESSIVE DISORDER | 0.6 |
| EMPHYSEMA & COPD | 0.5 |
| JLA3NAME | 0.5 |
| VJA2NAME | 0.5 |
| OTITIS EXTERNA | 0.4 |
| HEADACHE | 0.4 |
| ABNORMAL UNEXPLAINED BIOC | 0.4 |
| RJA6NAME | 0.4 |
| ALLERGIES | 0.4 |
| MLB3NAME | 0.4 |
| OTHER EYE DISEASES | 0.4 |
| HYPOTHYROIDISM, MYXEDEMA, | 0.3 |
| OTHER BURSITIS & SYNOVITI | 0.3 |
| PJA1NAME | 0.3 |
| OTHER MUSCULOSKEL, CONNEC | 0.3 |
| CONJUNCTIVITIS & OPHTHALM | 0.3 |
| QLB4NAME | 0.3 |
| ALCOHOL ABUSE & ALCOHOLIC | 0.3 |
| DIZZINESS & GIDDINESS | 0.3 |
| MJB4NAME | 0.3 |
| FLA5NAME | 0.3 |

APPENDIX E

MEDICATION PROFILE

The medication profile will be a routine report produced upon implementation of Phase Two, pharmacy input. It represents an accurate method of cataloging all medications to insure a complete patient record. More importantly, the report will assure that prescription abuse can readily be identified as well as the ability to more accurately identify those cases where conflicting medications have been prescribed.

Since the medication profile represents information ordered by the FPC, processed by the pharmacy, and ultimately reported back to the FPC, it serves as an example of how the CMRIS can integrate health care personnel (health care provider and pharmacist) and facilities (FPC and Pharmacy).

The medication profile can also act as an alert to high-risk medication situations. Conflicting medications can be immediately identified, prescription abuse is expeditiously reported, and drug recalls will be simplified. Finally, because of the system's ability to "recognize" prescription abuse, there exists the indirect benefit of cost control by reducing the number of duplicate prescriptions as well as the number of refills.

FORMAT OF MEDICATION PROFILE


LASTNAME,FIRSTNAME          20  123-45-6789        SEX         DATE  OF BIRTH

DATE PRESCRIBED    CLINIC      PRESCRIBER NAME
    RX NUMBER   MEDICATION FORM STRENGTH DOSE ROUTE FREQUENCY
              ADDITIONAL ISTRUCTIONS R:REFILLS   REFILL DATES...

03 MAR 82 FPC ARMSTRONG,C
    123456B PSEUDOEPHEDRINE HCL TAB 30 MG  1 PO TID  QTY:90  DO NOT DRIVE WHILE
              TAKING THIS MEDICATION   REFILL:3 02 APR 82   02 MAR 82

    123457R ...

APPENDIX F

"OVER 40" AND IMMUNIZATION REPORT

The capability of the CMRIS to alert the health care provider of high risk situations is the single most important potential benefit of the system's QA capability. Full utilization of this mechanism is not possible until both laboratory and pharmacy come on-line.

Two attempts were made, however, to use data currently available on the system to identify "risk" situations. The first was developed from the requirement to identify active duty Army personnel who are over 40 years of age for screening prior to beginning physical training programs. The medical screening program for Army personnel over 40 aims to safeguard from overactivity those soldiers susceptible to developing heart disease. Although the report generator used only age and sex criteria, other factors such as cigarette smoking, blood pressure, diabetes, cholesterol level, and electro-cardiogram abnormalities could also become part of the high risk alert.

The second attempt generated a report which alerts the health care provider of those children not fully immunized against childhood diseases. A standard FPC immunization protocol was used to program the selection criteria for this report. With the increasing emphasis on preventive medicine and health promotion such reports can prove to be a valuable tool in identifying risk situations before conflicting actions are taken or unattended risks proceed to adverse events.

ACTIVE DUTY 40 OR OLDER
16 MAR 82-16 MAR 82

| NAME | FMP | SFON SSN | BIRTHDATE | AGE | SEX | DOCTOR |
|------|-----|----------|-----------|-----|-----|--------|
| RAY H | 20 | ████████ | 09 APR 40 | 41 | MALE | ARMSTRONG,CHALMERS,M |
| ,JOHNNY | 20 | ████████ | 11 OCT 39 | 42 | MALE | ARMSTRONG,CHALMERS,M |
| ,JOHN E | 20 | ████████ | 25 APR 39 | 42 | MALE | ARMSTRONG,CHALMERS,M |
| ,BILLY C | 20 | ████████ | 28 JUL 41 | 40 | MALE | ARMSTRONG,CHALMERS,M |
| ,ANTONIO M | 20 | ████████ | 04 SEP 41 | 40 | MALE | ARMSTRONG,CHALMERS,M |
| ,ROBERT P | 20 | ████████ | 01 AUG 33 | 48 | MALE | ARMSTRONG,CHALMERS,M |
| ,GLENN G | 20 | ████████ | 18 JAN 32 | 50 | MALE | ARMSTRONG,CHALMERS,M |
| ,NORRIS W | 20 | ████████ | 24 AUG 39 | 42 | MALE | ARMSTRONG,CHALMERS,M |
| EDWIN D | 20 | ████████ | 28 JUL 41 | 40 | MALE | ARMSTRONG,CHALMERS,M |
| ,JERE L | 20 | ████████ | 11 APR 32 | 49 | MALE | ARMSTRONG,CHALMERS,M |
| ,THOMAS E | 20 | ████████ | 06 FEB 40 | 42 | MALE | ARMSTRONG,CHALMERS,M |
| ,ROSAURO,L | 20 | ████████ | 30 AUG 36 | 45 | MALE | ARMSTRONG,CHALMERS,M |
| ,JAMES V | 20 | ████████ | 06 JAN 39 | 43 | MALE | ARMSTRONG,CHALMERS,M |
| ,JAMES L | 20 | ████████ | 23 JUL 23 | 58 | MALE | ARMSTRONG,CHALMERS,M |
| ,JOHN W | 20 | ████████ | 22 FEB 34 | 48 | MALE | ARMSTRONG,CHALMERS,M |
| ,JOHN A | 20 | ████████ | 12 MAY 40 | 41 | MALE | ARMSTRONG,CHALMERS,M |
| ,BILLY D | 20 | ████████ | 24 FEB 42 | 40 | MALE | ARMSTRONG,CHALMERS,M |
| ,ROBERT G | 20 | ████████ | 04 JUN 39 | 42 | MALE | ARMSTRONG,CHALMERS,M |
| ,CYRUS N | 20 | ████████ | 06 APR 41 | 40 | MALE | ARMSTRONG,CHALMERS,M |
| ,WILLIAM T | 20 | ████████ | 08 OCT 38 | 43 | MALE | ARMSTRONG,CHALMERS,M |
| ,MEREDITH R | 20 | ████████ | 13 DEC 39 | 42 | MALE | ARMSTRONG,CHALMERS,M |
| | 20 | ████████ | 20 NOV 35 | 44 | MALE | ARMSTRONG,CHALMERS,M |

## FAMILY PRACTICE CLINIC

### IMMUNIZATION SCHEDULE

Recommended Immunizations for Children:

6 weeks to 2 months.........................#1 DPT, Polio #1

4 months...................................#2 DPT, Polio #2

6 months...................................#3 DPT, Polio #3

11 to 12 months............................Tine

15 months..................................Measles, Mumps, Rubella

18 months..................................#4 DPT, Polio (Boosters)

4 to 6 years...............................#5 DPT, Polio, Tine (Boosters)

Thereafter.................................D.T. (adults) every 10 years

Tetanus Toxoid following injury

| VACCINE | DOSE | INITIAL SERIES | BOOSTER | REIMMUNIZATION SCHEDULE |
|---------|------|----------------|---------|-------------------------|
| DPT | 0.5 cc SC or IM | 6 wk; 4 mo; 6 mo | 15-18 mo; 4-6 yrs (on entering school) | Reimmunization beyond basic series is not required. |
| Polio | 2 gtts. | 6 wk; 4 mo; 6 mo | 15-18 mo; 4-6 yrs (on entering school | Reimmunization beyond basic series is not required. |
| Tine | | 11-12 months | 6 yr; pre school once every 6 yrs. | Depends on exposure |
| Measles, Mumps, Rubella | 0.5 cc | 15 months | | |
| Tetanus Toxoid | 1cc | after 6 yrs of age | every 5 yrs if injury. Every 10 years if no injury | As necessary |
| Smallpox | Intra-dermal | Pre-school | Every 3 yrs | Only on request in Hawaii |

REACTIONS:

1. DPT....Fever, irritability and painful swelling of the injection site may occur 2-12 hours after injection. This may be treated by giving tylenol (or other fever medicine) according to the directions on the bottle.

2. MMR....A small number of children will develop fever and/or rash 7 to 10 days after the injection. This may last 2-5 days. This may be treated with tylenol (or other fever medicine).

PEDIATRICS IMMUNIZATION AUDIT PANEL
19 APR 82

| NAME | FMF | SFDN SSN | MONTHS | DATE | DOCTOR |
|---|---|---|---|---|---|
| SARAH E | 03 | ▬▬▬ | 18 | 27 JAN 82 | NORTON,LARRY,MD |
| JOHNNY L | 01 | ▬▬▬ | 22 | 09 FEB 82 | SCHIRNER,WAYNE,DO |
| MARK B | 03 | ▬▬▬ | 6 | 14 APR 82 | ZARINCZUK,JAMES,MD |
| REX | 02 | ▬▬▬ | 18 | 12 APR 82 | SARGENT,DAVID,DO |
| NATALIE V | 02 | ▬▬▬ | 19 | 19 DEC 80 | SCHIRNER,WAYNE,DO |
| JADRINA A | 03 | ▬▬▬ | 4 | 07 DEC 81 | FOTTS,JEROME,MD |
| JR,ANTHONY J | 02 | ▬▬▬ | 10 | 10 MAR 82 | ALMON,WILLIAM,MD |
| BRETT | 03 | ▬▬▬ | 10 | 19 JAN 82 | NORTON,LARRY,MD |
| ANTHONY P | 03 | ▬▬▬ | 11 | 01 APR 82 | ELLINGTON,DAVID,MD |
| ANTHONY W III | 02 | ▬▬▬ | 7 | 02 FEB 82 | WHITTAKER,PAUL,MD |
| KRISTAINA D | 01 | ▬▬▬ | 8 | 04 MAR 82 | ZINSER,JAMES,MD |
| STEVEN T | 01 | ▬▬▬ | 19 | 08 MAR 82 | SCHIRMER,WAYNE,DO |
| LINNEA C | 01 | ▬▬▬ | 16 | 19 FEB 81 | HICKS,TOMMY,MD |
| CLAIRE ELIZABETH | 03 | ▬▬▬ | 14 | 15 JAN 82 | ARMSTRONG,CHALMERS,M |
| JUDITH A | 02 | ▬▬▬ | 1 | 12 APR 82 | NORTON,LARRY,MD |
| CASSANDRA J | 01 | ▬▬▬ | 0 | | LECLAIR,BRUCE,MD |
| NATALIE A | 03 | ▬▬▬ | 7 | 04 DEC 81 | SCHIRMER,WAYNE,DO |
| WESLEY III | 03 | ▬▬▬ | 14 | 04 MAR 82 | BOYD,JOHN,MD |
| IERICA C | 01 | ▬▬▬ | 4 | 23 FEB 82 | HICKS,TOMMY,MD |
| ALEXIS | 02 | ▬▬▬ | 19 | | ARMSTRONG,CHALMERS,M |
| SYSVDNIA | 01 | ▬▬▬ | 18 | 12 APR 82 | PEEPLES,WILLIAM,MD |
| TYSON J | 02 | ▬▬▬ | 2 | 31 MAR 82 | ARMSTRONG,CHALMERS,M |
| SATURNINA A | 30 | ▬▬▬ | 4 | 08 FEB 82 | MELI,JAMES,DO |
| HEATHER | 01 | ▬▬▬ | 4 | 17 FEB 82 | ALMON,WILLIAM,MD |
| CRYSTAL S | 02 | ▬▬▬ | 9 | 11 APR 82 | HICKS,TOMMY,MD |
| JR,ROBERT | 02 | ▬▬▬ | 8 | 24 JAN 82 | PEEPLES,WILLIAM,MD |
| WENDY | 01 | ▬▬▬ | 9 | 30 MAR 82 | MELI,JAMES,DO |
| TIMOTHY | 02 | ▬▬▬ | 15 | 26 MAR 82 | RAMPTON,MARK,MD |
| RICHARD E | 02 | ▬▬▬ | 11 | | SCHIRMER,WAYNE,DO |
| SHAUN P | 01 | ▬▬▬ | 13 | 30 MAR 82 | WHITTAKER,PAUL,MD |
| ARTHUR | 20 | ▬▬▬ | 153 | | ZARINCZUK,JAMES,MD |
| CHRISTINE | 02 | ▬▬▬ | 10 | 29 MAR 82 | ZINGER,JAMES,MD |
| WILLIAM | 03 | ▬▬▬ | 20 | 08 APR 82 | POTTS,JEROME,MD |
| MARCUS A | 01 | ▬▬▬ | 15 | 16 FEB 82 | BOYD,JOHN,MD |
| MARK A | 02 | ▬▬▬ | 15 | 16 FEB 82 | BOYD,JOHN,MD |
| MICHAEL A | 03 | ▬▬▬ | 15 | 18 FEB 82 | BOYD,JOHN,MD |
| JENNIFER M | 02 | ▬▬▬ | 8 | 18 FEB 82 | MELI,JAMES,DO |
| MARIA C | 01 | ▬▬▬ | 19 | 31 MAR 82 | HICKS,TOMMY,MD |
| DAVID W | 02 | ▬▬▬ | 7 | 05 MAR 82 | ARMSTRONG,CHALMERS,M |
| DIANNA | 02 | ▬▬▬ | 6 | 29 MAR 82 | WHITTAKER,PAUL,MD |
| RAUVEL ADAM | 04 | ▬▬▬ | 15 | 28 JAN 82 | NORTON,LARRY,MD |
| MICHAEL S | 01 | ▬▬▬ | 23 | | PEEPLES,WILLIAM,MD |
| RUSSELL N | 02 | ▬▬▬ | 15 | 14 APR 82 | ZARINCZUK,JAMES,MD |
| LEWIS A | 02 | ▬▬▬ | 8 | 02 APR 82 | PEEPLES,WILLIAM,MD |
| JENNIFER L | 02 | ▬▬▬ | 17 | 25 MAR 82 | PEEPLES,WILLIAM,MD |
| TODD | 02 | ▬▬▬ | 10 | 18 MAR 82 | SARGENT,DAVID,DO |
| AMY L | 01 | ▬▬▬ | 4 | 18 MAR 82 | HICKS,TOMMY,MD |
| MICHAEL D | 01 | ▬▬▬ | 5 | 07 APR 82 | SARGENT,DAVID,DO |
| CHRISIENE | 01 | ▬▬▬ | 15 | 02 FEB 82 | POTTS,JEROME,MD |
| JENNIFER A | 01 | ▬▬▬ | 17 | 31 JUL 81 | PEEPLES,WILLIAM,MD |
| MICHAEL J | 02 | ▬▬▬ | 15 | 08 MAR 82 | LECLAIR,BRUCE,MD |
| CHRISTOPHER | 02 | ▬▬▬ | 14 | 14 JAN 82 | LECLAIR,BRUCE,MD |
| KATHRYN M | 01 | ▬▬▬ | 15 | 30 MAR 82 | SODDELL,THOMAS,MD |
| KATHRYN A | 02 | ▬▬▬ | 22 | 05 MAR 82 | ARMSTRONG,CHALMERS,M |
| ORBIN C | 01 | ▬▬▬ | 23 | 05 APR 82 | SARGENT,DAVID,DO |
| ANDREW D | 05 | ▬▬▬ | 9 | 01 MAR 82 | NORTON,LARRY,MD |

APPENDIX G

DIABETIC AND OBSTETRICAL CHART

AUDIT REVIEW

In an effort to determine how helpful the CMRIS Phase
One capability could be for chart auditing, a listing of
current diabetic patients was produced using the ad hoc
report generator function. One hundred and one patients
were identified by name, FMP, SSN, age, and primary physi-
cian. In addition, the listing provided the number of
visits made to the FPC by the patient. This report, shown
at Inclosure 1, was considered an important advance in
auditing procedures since it represented a selection of
ambulatory patients by diagnoses. Heretofore, this was a
monumental task requiring manual searches of hundreds of
outpatient records.

From this listing ten patients were selected to have
their most current status reports produced and reviewed
(Inclosure 2). Although a full professional audit was not
done under the guidance of a physician, it was apparent that
the status reports alone could not verify or deny the cri-
teria for diabetes established by the FPC (Inclosure 3). In
fact, only item four (follow up visits) could be determined
to any degree of certainty.

The same technique was used for obstetrical patients
selected from the listing at Inclosure 4 using specific
criteria developed by the FPC (Inclosure 5). The outcome
was essentially the same and the status reports (Inclosure
6) no more definitive.

The chart audit review represents what is perhaps a premature attempt to use CMRIS status report data to access compliance with established criteria. Obviously, the entire medical record will always be needed to conduct a complete audit. However, the potential for reviewing a large number of patients for critical items does exist. With the full implementation of Phase Two, it is possible that all criteria can be quickly reviewed since they will appear on the status report. The next logical step would be the use of a "plan set" (Inclosure 7) to identify deviations and automatically report only those not meeting the criteria. Such an approach is graphically outlined in Figure 4.

DIABETES AUDIT PANEL
08 AFK 82
PAGE 2

| NAME | FMP | SFDN SSN | AGE | DOCTOR | AGE | NUMBER |
|---|---|---|---|---|---|---|
| ISAIAH L | 20 | ████ | 60 | MORRISON,JIMMIE D.MD | 60 | 11 |
| MILDE E | 30 | ████ | 54 | RAMPTON,MARK,MD | 54 | 2 |
| THEODORE J | 20 | ████ | 74 | RAMPTON,MARK,MD | 74 | 16 |
| JUANA | 30 | ████ | 52 | SCHIRNER,WAYNE,DO | 52 | 20 |
| JENNIFER | 30 | ████ | 24 | SCHIRNER,WAYNE,DO | 24 | 16 |
| MILLIE M | 30 | ████ | 62 | SCHIRNER,WAYNE,DO | 62 | 13 |
| CONSTANCE J | 30 | ████ | 59 | SCHIRNER,WAYNE,DU | 59 | 17 |
| BLUMIE | 30 | ████ | 62 | MORRISON,JIMMIE D.MD | 62 | 2 |
| RONALD R | 20 | ████ | 69 | RAMPTON,MARK,MD | 69 | 20 |
| ANGEL | 20 | ████ | 75 | RAMPTON,MARK,MD | 75 | 5 |
| JAMES | 20 | ████ | 61 | RAMPTON,MARK,MD | 61 | 6 |
| BARBARA | 30 | ████ | 46 | RAMPTON,MARK,MD | 46 | 2 |
| BETTY L | 30 | ████ | 40 | MORRISON,JIMMIE D.MD | 40 | 7 |
| HIROKO S | 30 | ████ | 45 | SCHIRNER,WAYNE,DO | 45 | 4 |
| RHODY P | 30 | ████ | 42 | MORRISON,JIMMIE D.MD | 42 | 13 |
| MARY E | 20 | ████ | 60 | RAMPTON,MARK,MD | 60 | 4 |
| THOMAS H | 20 | ████ | 60 | RAMPTON,MARK,MD | 60 | 2 |
| IOLA A | 30 | ████ | 63 | SCHIRNER,WAYNE,DO | 63 | 4 |
| VIRGINIA H | 30 | ████ | 58 | RAMPTON,MARK,MD | 58 | 13 |
| ALICE L | 30 | ████ | 55 | RAMPTON,MARK,MD | 55 | 14 |
| PERCY U | 20 | ████ | 71 | RAMPTON,MARK,MD | 71 | 4 |
| COMBORCIA D | 30 | ████ | 64 | RAMPTON,MARK,MD | 64 | 7 |
| EMILIO A | 20 | ████ | 70 | MORRISON,JIMMIE D.MD | 70 | 18 |
| ANITA B | 30 | ████ | 81 | RAMPTON,MARK,MD | 81 | 13 |
| DOROTHY H | 30 | ████ | 47 | RAMPTON,MARK,MD | 47 | 4 |
| MILLIE J | 20 | ████ | 54 | RAMPTON,MARK,MD | 54 | 18 |
| CATALINA P | 30 | ████ | 55 | MORRISON,JIMMIE D.MD | 55 | 13 |
| KATHERINE E | 03 | ████ | 16 | RAMPTON,MARK,MD | 16 | 14 |
| KAY | 30 | ████ | 47 | WHITTAKER,PAUL,MD | 47 | 4 |
| ROBERT L | 20 | ████ | 55 | MORRISON,JIMMIE D.MD | 55 | 5 |
| WALTER M | 20 | ████ | 78 | WHITTAKER,PAUL,MD | 78 | 3 |
| ROBERT | 20 | ████ | 42 | MORRISON,JIMMIE D.MD | 42 | 14 |
| BARBARA | 30 | ████ | 66 | RAMPTON,MARK,MD | 66 | 8 |
| JAMES R | 20 | ████ | 51 | LECLAIR,BRUCE,MD | 51 | 8 |
| MARY B | 40 | ████ | 66 | WHITTAKER,PAUL,MD | 66 | 18 |
| GERALD D | 20 | ████ | 53 | RAMPTON,MARK,MD | 53 | 13 |
| EILEEN E | 30 | ████ | 67 | RAMPTON,MARK,MD | 67 | 8 |
| LOIS | 30 | ████ | 41 | ARMSTRONG,CHALMERS,M | 41 | 12 |
| BENNIE | 20 | ████ | 48 | SCHIRNER,WAYNE,DO | 48 | 4 |
| JACOB E | 20 | ████ | 45 | RAMPTON,MARK,MD | 45 | 41 |
| BILLIE J | 30 | ████ | 19 | MORRISON,JIMMIE D.MD | 19 | 12 |
| ELINOR L | 30 | ████ | 73 | SCHIRNER,WAYNE,DO | 73 | 10 |
| SUMNER S | 30 | ████ | 70 | WHITTAKER,PAUL,MD | 70 | 11 |
| GOLDINE Y | 30 | ████ | 56 | RAMPTON,MARK,MD | 56 | 13 |
| ARTHUR | 20 | ████ | 60 | MORRISON,JIMMIE D.MD | 60 | 8 |

STATUS REPORT                FMP:30   SSN: ███████████        PRINTED: 12 APR 82

███████████ F (F) 48 YRS    (30 DEC 33)
    239 ███████████ RIVE SALINAS,CA 93905
    HOME:  422-█████        WORK:  422-█████              TMC: NONE


-------------------------------- DIAGNOSES/PROBLEMS --------------------------

    RJAL4-1 VAGINITIS NOS, VULVITIS                25MAR82-2-30MAR82
            NON-SPECIFIC
    EHAZ6-1 DIABETES MELLITUS                      25MAR82-2-30MAR82
    BMBF2   ADVICE & HEALTH INSTRUCTION            29MAR82-3-30MAR82


------------------------- RECORDED ALLERGIES/SENSITIVITIES -------------------

  * ALLERGIES                                                 30MAR82
        RASH


------------------------- VITAL SIGNS - LAST VISIT ---------------------------

  * TEMPERATURE                     97.8        25MAR82-2-30MAR82
    WEIGHT                          125.75      25MAR82-2-30MAR82
    BLOOD PRESSURE                  117/76      25MAR82-2-30MAR82


(30 DEC 33)

STATUS REPORT          FMP:30   SSN: ▮▮▮▮▮▮▮▮          PRINTED: 12 APR 82

▮▮▮▮▮,LILLIAN V (F) 63 YRS     (10 NOV 18)
    15660 ▮▮▮▮▮▮▮PL SALINAS,CA 93907

| HOME: 633-▮▮▮▮ | WORK: N | TMC: NONE |
|---|---|---|

------------------------ DIAGNOSES/PROBLEMS ------------------------

| Code | Diagnosis | Date |
|---|---|---|
| EHAZ6-1 | DIABETES MELLITUS | 18MAR80-4-20APR81 |
| VLEL6-1 | SPRAIN OR STRAIN KNEE & LOWER LEG | 17NOV80 |
| WLDF9 | DIZZINESS & GIDDINESS | 18MAR80 |
| MHAE8 | HYPERTENSION, UNCOMPLICATED | 18MAR80 |
| TJAF6 | CYSTITIS & URINARY INFECTION NOS | 18MAR80 |

STATUS REPORT          FMP:30  SSN: ███████████       PRINTED: 12 APR 82

█████,JEWELL L (F) 62 YRS    (30 APR 19)
     1129 ███████████ AVE SALINAS,CA 93905
     HOME: 424-█████              WORK: N                    TMC: NONE


-------------------------------- DIAGNOSES/PROBLEMS ------------------------------

    DJCF2    PROPHYLACTIC IMMUNIZATION              26SEP79-17-21AUG81
    WGAW5    HEADACHE                               21AUG80-2-05MAY81
    RJAB6-1  MENOPAUSAL SYMPTOMS & POST             19NOV79-3-08DEC80
             MENO BLEED
    BHNY8    LETTER, FORMS, PRESCRIPTION                      20MAR80
             WO EXAM
    EHAZ6-1  DIABETES MELLITUS                                19OCT79
    QKBS4    MALIG NEOPL                                      19OCT79
             GASTROINTESTINAL TRACT

STATUS REPORT            FMP:50  SSN: ██████████      PRINTED: 12 APR 82

████████,DOROTEA L (F) 82 YRS   (07 FEB 00)
    1751 ████████████ SEASIDE,CA 93955
    HOME: 394-█████        WORK: N                    TMC: NONE


-------------------------- DIAGNOSES/PROBLEMS --------------------------

| | | |
|---|---|---|
| YMBG3 | OTHER MENTAL & PSYCHOLOGIC DISORDER | 22MAY80 |
| QJCH9 | PRESUMED INFECTIOUS INTESTIN DISEAS | 22MAY80 |
| TJAF6 | CYSTITIS & URINARY INFECTION NOS | 16MAY80 |
| WLCK7 | SIGN, SYMPTOM, ILL DEFINED COND NEC | 08APR80 |
| GLGY3 | MED OR SURG PROCEDURE WO DIAGNOSIS | 24MAR80-3-31MAR80 |
| KKBJ1 | NEOPL NYD AS BENIGN OR MALIGNANT | 18MAR80 |
| CLHE1 | A VITAMIN & NUTRITIONAL DISORDER NEC | 29FEB80 |
| EHAZ6-1 | DIABETES MELLITUS | 29JAN80 |
| MHAE8 | HYPERTENSION, UNCOMPLICATED | 29JAN80 |

STATUS REPORT          FMP:20  SSN: ████████████          PRINTED: 12 APR 82

████████,GERMANO P (M) 46 YRS    (21 DEC 35)
    642 ████████████ SALINAS,CA 93906
    HOME: 449-█████          WORK: 242-█████          TMC: NONE


---------------------------- DIAGNOSES/PROBLEMS ----------------------------

    MHAE8    HYPERTENSION, UNCOMPLICATED              08JAN81-3-17NOV81
    EHAZ6-1  DIABETES MELLITUS                        08JAN81-3-17NOV81
    QLAS1-1  OBESITY                                  21JAN81-2-17NOV81
    CGAT3    HEART MURMUR NEC, NYD                             08JAN81


---------------------------- VITAL SIGNS - LAST VISIT ----------------------------

    TEMPERATURE                      98.2              17NOV81
    WEIGHT                           238               17NOV81
    BLOOD PRESSURE                   150/80            17NOV81

STATUS REPORT          FMP:20   SSN: ███████████      PRINTED: 12 APR 82

████████,RAY J (M) 60 YRS    (28 FEB 22)
621 ██████ ST SALINAS,CA 93905
HOME: 422-█████              WORK: N                        TMC: NONE

-------------------------------- DIAGNOSES/PROBLEMS --------------------------

    EHAZ6-1 DIABETES MELLITUS                    06JUN80-14-05FEB82
    HHAE8   HYPERTENSION, UNCOMPLICATED                  05FEB82
    GJBX4   BOIL & CELLULITIS INCL                       27JUL81
            FINGR & TOE
    GLAF5-1 CHRONIC SKIN ULCER                   21NOV80-5-23DEC80
    JJBR6   OTITIS EXTERNA                               03NOV80
    GLAH2-1 INGROWN TOENAIL & NAIL                       17OCT80
            DISEASE NEC
    VLGE7   CERVICAL SPINE SYNDROMES                     23SEP80
    VLHX2   SPRAIN OR STRAIN SHOULDER &                  06SEP80
            ARM
    FLAY1-1 IRON DEFICIENCY ANEMIA                       25FEB80
    BHAA7   MEDICAL EXAM                                 19FEB80
    VLGP5   SHOULDER SYNDROMES                           10SEP79


----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS --------------

PROCEDURES
    BLOOD PRESSURE PROCEDURE                             05FEB82
    VITAL SIGNS PROCEDURE                                05FEB82
    PATIENT CONSULT                                      06JAN82


---------------------------- VITAL SIGNS - LAST VISIT ----------------------

    TEMPERATURE                      97.2        06JAN82-2-05FEB82
    WEIGHT                           213         06JAN82-2-05FEB82
    BLOOD PRESSURE                   138/70      06JAN82-2-05FEB82


----------------- REFERRALS AND APPOINTMENT - LAST VISIT ---------------

               APPOINTMENT IN 1 MONTHS                   06JAN82

STATUS REPORT                    FMP:30  SSN: ████████████        PRINTED: 12 APR 82

████KIYONO (F) 45 YRS    (22 OCT 36)
      1582 ███████████ SALINAS,CA 93906
      HOME: 449-█████            WORK: 242-█████                TMC: NONE


------------------------------ DIAGNOSES/PROBLEMS -----------------------

    EHAZ6-1 DIABETES MELLITUS                          20JUL81-2-17DEC81
    MHBX3   ATRIAL FIBRILLATION OF                            17DEC81
            FLUTTER
    BMBF2   ADVICE & HEALTH INSTRUCTION                30APR80-2-01MAY80


----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS --------------

PROCEDURES
    VITAL SIGNS PROCEDURE                                    17DEC81


-------------------- VITAL SIGNS - LAST VISIT ----------------------

    TEMPERATURE                        98          16NOV81-2-17DEC81
    WEIGHT                            124          16NOV81-2-17DEC81
    BLOOD PRESSURE                 100/70          16NOV81-2-17DEC81


------------------- REFERRALS AND APPOINTMENT - LAST VISIT --------------

            APPOINTMENT IN 3 MONTHS WITH KUGLER (NO      17DEC81
                SUSPENSE DATE)

    REFERRALS      GYNECOLOGY                               17DEC81

STATUS REPORT          FMP:30  SSN: ██████████         PRINTED: 12 APR 82

████████,JENNIFER (F) 24 YRS   (19 MAR 58)
    405 ████████ FT ORD,CA 93941
      HOME: 384-█████         WORK: 242-█████           TMC: NONE


------------------------------ DIAGNOSES/PROBLEMS ------------------------

    DMAM3-1 VIRAL· INFECTION NOS                           07APR82
    EHAZ6-1 DIABETES MELLITUS                     02JUN81-13-31MAR82
            INSULIN DEPENDENT
    BHNK3-1 POSTNATAL CARE                        11DEC81-2-28JAN82
    EJAX2   OTHER ENDOCR, NUTRITN,                15JAN82-2-28JAN82
              METABOL DISORD
            HYPOGLYCEMIA
    RMGJ8   PRENATAL CARE                         02JUN81-9-21AUG81


------------------ SURGERIES, PROCEDURES, AND IMMUNIZATIONS --------------

PROCEDURES
    VITAL SIGNS PROCEDURE                         11DEC81-4-28JAN82
    COMPLETE PHYSICAL EXAMINATION                           28JAN82
    PELVIC EXAMINATION AND OR PAP SMEAR                     28JAN82
    PARTIAL PHYSICAL EXAMINATION                  11DEC81-2-31DEC81


----------------------- VITAL SIGNS - LAST VISIT ------------------------

    TEMPERATURE                      98.7        11DEC81-4-07APR82
    WEIGHT                           124.5       11DEC81-5-07APR82
    BLOOD PRESSURE                   110/68      11DEC81-4-07APR82

STATUS REPORT          FMP:30  SSN: ████████████      PRINTED: 12 APR 82

████████,BARBARA (F) 66 YRS    (03 OCT 15)
 637 ████████████ SALINAS,CA 93901
  HOME: 422-█████            WORK: N                    TMC: NONE

------------------------------ DIAGNOSES/PROBLEMS ------------------------------

 EJAX2    OTHER·ENDOCR, NUTRITN,                          23MAR82
     METABOL DISORD
     GLUCOSE INTOLERENCE
 VLGP5    SHOULDER SYNDROMES                              23MAR82
     SHOULDER PAIN-L
 EHAZ6-1 DIABETES MELLITUS                       21AUG81-3-22JAN82
 TGAT2-1 ABDOMINAL PAIN                          21JAN81-2-03AUG81
 BMBF2    ADVICE & HEALTH INSTRUCTION                     16OCT80


----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS ----------------

PROCEDURES
 VITAL SIGNS PROCEDURE                                    22JAN82


----------------------- VITAL SIGNS - LAST VISIT -----------------------

 * TEMPERATURE                    98.5        22JAN82-3-23MAR82
  WEIGHT                       163.5        22JAN82-3-23MAR82
  BLOOD PRESSURE               122/70       22JAN82-3-23MAR82

STATUS REPORT          FMP:20  SSN: ████████         PRINTED: 12 APR 82

████████,PERCY W (M) 71 YRS   (13 AUG 10)
   1711 ████████████ SEASIDE,CA 93955
   HOME: 394-█████          WORK: N                    TMC: NONE


------------------------- DIAGNOSES/PROBLEMS -------------------------

   BHNY8    LETTER, FORMS, PRESCRIPTION          18AUG81-2-01APR82
            WO EXAM
   JJBP9    ACUTE UPPER RESPIR TRACT                 09MAR82
             INFECTION
   EHAZ6-1  DIABETES MELLITUS                        24AUG81
   MHAE8    HYPERTENSION, UNCOMPLICATED              24AUG81
   QJDA4    IRRIT BOWEL SYNDR OR INTEST              24AUG81
            DISOR NEC


------------------------- VITAL SIGNS - LAST VISIT -------------------------

   TEMPERATURE                      97.9               09MAR82
   BLOOD PRESSURE                   120/80             09MAR82

DIABETIC CHART AUDIT

atient: _____    Chart # _____

Physician: _____

|  | Complete | Incomplete |
|---|---|---|
| . Problem List | | |
| . Medication List | | |
| . Documentation | | |
| a. Ophthalmology consult | | |
| b. Podiatry consult * | | |
| c. Instruction in insulin usage or oral hypoglycemics if given * | | |
| d. Dietary consult * | | |
| * or documentation of being performed by primary physician | | |
| . Follow-up visit ever 2-3 months if on insulin or hypoglycemics; every 6-12 months if diet controlled | | |
| i. Basic laboratory data: Renal function test, lytes, CBC, urine, urine culture | | |
| ). Recurrent laboratory data: FBS (lower than 200), urine S/A | | |
| '. P.E.: Fundus, BP, C.V., Skin Peripheral Sensation, DTR | | |

)verall evaluation        Acceptable [  ]        Unacceptable [  ]

:omments:

:valuating physician: _____

97

| NAME | FMF | SFDN SSN | DOCTOR | NUMBER |
|---|---|---|---|---|
| SUSAN S | 30 | ▓▓▓▓ | NORTON,LARRY,MD | 10 |
| NELIA B | 30 | ▓▓▓▓ | ZARINCZUK,JAMES,MD | 5 |
| FELECIANA G | 50 | ▓▓▓▓ | ZARINCZUK,JAMES,MD | 3 |
| NANCY M | 30 | ▓▓▓▓ | SCHIRNER,WAYNE,DO | 14 |
| KAREN C | 30 | ▓▓▓▓ | WHITTAKER,PAUL,MD | 5 |
| ROSALINDA | 30 | ▓▓▓▓ | FOTTS,JEROME,MD | 5 |
| JILENE F | 30 | ▓▓▓▓ | NORTON,LARRY,MD | 12 |
| PETRA E | 30 | ▓▓▓▓ | MORRISON,JIMMIE D,MD | 7 |
| GLORIA S | 30 | ▓▓▓▓ | UNKNOWN,DOCTOR | 16 |
| ELISABETH I | 02 | ▓▓▓▓ | HICKS,TOMMY,MD | 5 |
| JULIA | 30 | ▓▓▓▓ | UNKNOWN,DOCTOR | 1 |
| ROXANNE | 30 | ▓▓▓▓ | WHITTAKER,PAUL,MD | 11 |
| CHERYL D | 30 | ▓▓▓▓ | ZIMSER,JAMES,MD | 10 |
| PATRICIA A | 30 | ▓▓▓▓ | TUCKER,WILLIAM,DO | 16 |
| TERRI L | 30 | ▓▓▓▓ | SCHIRNER,WAYNE,DO | 19 |
| SHERRIE M | 30 | ▓▓▓▓ | HICKS,TOMMY,MD | 9 |
| YVONNE | 30 | ▓▓▓▓ | ZINSER,JAMES,MD | 4 |
| MELINDA J | 30 | ▓▓▓▓ | NORTON,LARRY,MD | 11 |
| V KAYE | 30 | ▓▓▓▓ | ARMSTRONG,CHALMERS,M | 7 |
| NORMA A | 30 | ▓▓▓▓ | LECLAIR,BRUCE,MD | 10 |
| PRINCESS J | 20 | ▓▓▓▓ | PEEPLES,WILLIAM,MD | 7 |
| DENICE K | 30 | ▓▓▓▓ | ZINSER,JAMES,MD | 6 |
| LINDA M | 30 | ▓▓▓▓ | SCHIRNER,WAYNE,DO | 11 |
| KATERINA M | 30 | ▓▓▓▓ | ARMSTRONG,CHALMERS,M | 4 |
| LERNA J | 30 | ▓▓▓▓ | GODDELL,THOMAS,MD | 12 |
| MARILYN J | 30 | ▓▓▓▓ | BOYD,JOHN,MD | 5 |
| MAMILDA A | 01 | ▓▓▓▓ | ZARINCZUK,JAMES,MD | 8 |
| CAROLYN A | 30 | ▓▓▓▓ | HICKS,TOMMY,MD | 6 |
| DAWN M | 20 | ▓▓▓▓ | GODDELL,THOMAS,MD | 8 |
| DOMMA M | 30 | ▓▓▓▓ | HICKS,TOMMY,MD | 2 |
| BERTHA | 30 | ▓▓▓▓ | PEEPLES,WILLIAM,MD | 2 |
| VERONICA | 30 | ▓▓▓▓ | LECLAIR,BRUCE,MD | 3 |
| ALEXANDRA M | 30 | ▓▓▓▓ | ARMSTRONG,CHALMERS,M | 23 |
| CAROL M | 20 | ▓▓▓▓ | HICKS,TOMMY,MD | 5 |
| SATURNINA A | 30 | ▓▓▓▓ | MELI,JAMES,DO | 5 |
| LISA | 20 | ▓▓▓▓ | HICKS,TOMMY,MD | 27 |
| DEBORAH K | 30 | ▓▓▓▓ | PEEPLES,WILLIAM,MD | 5 |
| LINDA M | 04 | ▓▓▓▓ | MELI,JAMES,DO | 5 |
| SILKE A | 30 | ▓▓▓▓ | MELI,JAMES,DO | 8 |
| MARY L | 30 | ▓▓▓▓ | PEEPLES,WILLIAM,MD | 9 |
| LAURA L | 30 | ▓▓▓▓ | RAMTOM,MARK,MD | 4 |
| DARLENE D | 30 | ▓▓▓▓ | SCHIRNER,WAYNE,DO | 9 |
| BRENDA C | 30 | ▓▓▓▓ | SCHIRNER,WAYNE,DO | 16 |
| ROSALIA F | 30 | ▓▓▓▓ | WHITTAKER,PAUL,MD | 12 |
| ANGELA | 30 | ▓▓▓▓ | WHITTAKER,PAUL,MD | 6 |
| JUDITH A | 30 | ▓▓▓▓ | ZINSER,JAMES,MD | 12 |
| JOAN F | 20 | ▓▓▓▓ | MELI,JAMES,DO | 12 |
| JOAN F | 20 | ▓▓▓▓ | MELI,JAMES,DO | 3 |
| SANDRA | 20 | ▓▓▓▓ | SARGENT,DAVID,DO | 6 |
| YONG OK | 30 | ▓▓▓▓ | ARMSTRONG,CHALMERS,M | 21 |
| BERNADETTE D | 30 | ▓▓▓▓ | WHITTAKER,PAUL,MD | 6 |
| MARIA G | 30 | ▓▓▓▓ | NORTON,LARRY,MD | 8 |
| MICHELLA A | 30 | ▓▓▓▓ | PEEPLES,WILLIAM,MD | 8 |
| LINDA S | 30 | ▓▓▓▓ | ZARINCZUK,JAMES,MD | 8 |
| VAN M | 30 | ▓▓▓▓ | WHITTAKER,PAUL,MD | 4 |
| MARLENE A | 30 | ▓▓▓▓ | HICKS,TOMMY,MD | 9 |

## OBSTETRICAL PATIENT CARE AUDIT

Date _____

Chart # _____

·Auditing Physician _____

|  | COMPLETE | INCOMPLETE |
|---|---|---|
| 1) Patient ID Data | | |
| 2) EDC, LMP, or corrected EDC recorded in chart | | |
| 3) Appropriate data for each visit recorded (wt, BP, urine, etc) | | |
| 4) Lab Data on chart – Type, Rh, Hct, Hgb, PAP smear, Serology | | |
| 5) Review of Systems Analysis | | |
| 6) Past Medical History and Family History | | |
| 7) Previous obstetrical record | | |
| 8) Complete P.E. | | |
| 9) Pelvic Exam with Obstetrical Prognosis | | |
| 10) Chart legible | YES | NO |

Comments:

Overall: _____ Acceptable          _____ Unacceptable

STATUS REPORT               FMP:30  SSN: ██████████        PRINTED: 19 APR 82

████████ SHARON L (F) 17 YRS  (12 AUG 64)
     215██████████ FORT ORD,CA 93941
     HOME: N                    WORK: 242-██████         TMC: NONE


------------------------------ DIAGNOSES/PROBLEMS ------------------------------

    BMBF2   ADVICE & HEALTH INSTRUCTION              02FEB82-2-24MAR82
    RMGJ8   PRENATAL CARE                            02FEB82-2-19FEB82
    RKCK2   OTHER COMPLICATIONS OF                            02FEB82
            PREGNANCY
            HYPEREMESIS


------------------ SURGERIES, PROCEDURES, AND IMMUNIZATIONS ------------------

PROCEDURES
    PARTIAL PHYSICAL EXAMINATION                              02FEB82
    VITAL SIGNS PROCEDURE                                    02FEB82


------------------------- VITAL SIGNS - LAST VISIT -------------------------

    WEIGHT                          122       02FEB82-2-24MAR82
    BLOOD PRESSURE                  100/62    02FEB82-2-24MAR82
  * TEMPERATURE                     99.7               24MAR82


------------------- REFERRALS AND APPOINTMENT - LAST VISIT -------------------

    *          APPOINTMENT IN 1 MONTHS WITH TUCKER (NO    02FEB82
               SUSPENSE DATE)

STATUS REPORT　　　　　　　FMP:30　SSN: ████████　　　　PRINTED: 19 APR 82

████████,DONNA L (F) 25 YRS　(26 NOV 56)
　　98 ████████ ROAD FORT ORD,CA 93941
　　HOME: 899-████　　　　　　WORK: 242-████　　　　　TMC: NONE

------------------------- DIAGNOSES/PROBLEMS ----------------------------

| Code | Diagnosis | Date |
|---|---|---|
| RMGJ8 | PRENATAL CARE | 15AUG80-6-07APR82 |
| JJCJ1 | SINUSITIS, ACUTE & CHRONIC RULE OUT SINUSITIS | 09DEC81-2-03MAR82 |
| BMBF2 | ADVICE & HEALTH INSTRUCTION | 09FEB82-2-10FEB82 |
| GLGY3 | MED OR SURG PROCEDURE WO DIAGNOSIS | 10AUG81 |
| JJBF9 | ACUTE UPPER RESPIR TRACT INFECTION | 07AUG81 |
| JJCR2 | ACUTE TONSILLITIS & QUINSY | 05AUG81 |
| JLAV3-1 | HAY FEVER | 05AUG81 |
| BHNK3-1 | POSTNATAL CARE | 17FEB81 |
| YMAX9-1 | PREGNANCY OUT OF WEDLOCK | 24DEC80 |

-------------------- RECORDED ALLERGIES/SENSITIVITIES ----------------------

* HAY FEVER　　　　　　　　　　　　　　　　　　　　　　09DEC81

----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS -----------------

PROCEDURES
　　VITAL SIGNS PROCEDURE　　　　　　　　　　　　09DEC81-2-08FEB82
　　PELVIC EXAMINATION AND OR PAP SMEAR　　　　　　05JAN82
　　ASPIRATION　　　　　　　　　　　　　　　　　　05JAN82

----------------- REFERRALS AND APPOINTMENT - LAST VISIT -------------------

0　　　　　　　　　APPOINTMENT IN 2 WEEKS WITH ZARINCZ　　09DEC81

STATUS REPORT            FMP:30  SSN: ▓▓▓▓▓▓▓        PRINTED: 19 APR 82

▓▓▓MAYRA R (F) 27 YRS   (16 JUN 54)
   347 ▓▓▓▓▓▓▓▓▓▓ FORT ORD, CA 93941
   HOME: 899-▓▓▓▓        WORK: 242-▓▓▓▓              TMC: NONE

---------------------- DIAGNOSES/PROBLEMS ----------------------

   QHAH1-1  HEMORRHOIDS                                 30MAR82
   RMGJ8    PRENATAL CARE                     22DEC81-2-11FEB82
   JJBP9    ACUTE UPPER RESPIR TRACT                    29DEC81
            INFECTION
   HLCD3    CONJUNCTIVITIS & OPHTHALMIA                 27JAN81

----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS -----------------

PROCEDURES
   PARTIAL PHYSICAL EXAMINATION                         29DEC81
   VITAL SIGNS PROCEDURE                                22DEC81

----------------- REFERRALS AND APPOINTMENT - LAST VISIT -----------------

   1              APPOINTMENT PRN WITH MELI             29DEC81

STATUS REPORT                    FMP:30   SSN: ████████████        PRINTED: 19 APR 82

████████,URSEL (F) 33 YRS    (24 MAR 49)
    150 ████████████ROAD FORT ORD,CA 93941
    HOME: 899-██████         WORK: 242-██████          TMC: NONE

--------------------------------- DIAGNOSES/PROBLEMS ---------------------------------

    RMGJ8    PRENATAL CARE                           01DEC81-4-25MAR82

------------------ SURGERIES, PROCEDURES, AND IMMUNIZATIONS ------------------

PROCEDURES
    PARTIAL PHYSICAL EXAMINATION                          26JAN82
    VITAL SIGNS PROCEDURE                                 26JAN82

STATUS REPORT        FMP:20  SSN: ███████████        PRINTED: 19 APR 82

██████,FRANCISA M (F) 26 YRS    (01 MAY 55)
     13226 ███████████ CASTROVILLE,CA 95012
     HOME: 633-█████          WORK: 242-█████              TMC: NONE

----------------------------- DIAGNOSES/PROBLEMS -----------------------------

     RMGJ8    PRENATAL CARE                       03DEC81-6-25FEB82
     DJCF2    PROPHYLACTIC IMMUNIZATION                   04FEB82

----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS -----------------

PROCEDURES
     PARTIAL PHYSICAL EXAMINATION                 06DEC81-4-12FEB82
     VITAL SIGNS PROCEDURE                        06DEC81-6-12FEB82
     PATIENT CONSULT                                      04FEB82

------------------------- VITAL SIGNS - LAST VISIT -------------------------

     WEIGHT                          172          03DEC81-7-18FEB82

STATUS REPORT            FMP:30  SSN: ████████████        PRINTED: 19 APR 82

████████ DELORES (F) 22 YRS   (05 JUL 59)
    109 ███████████    FORT ORD,CA 93941
    HOME: 899 █████              WORK: 242 ██████           TMC: NONE

------------------------------ DIAGNOSES/PROBLEMS ------------------------------

    RMGJ8    PRENATAL CARE                                    26FEB81
    BHAA7    MEDICAL EXAM                                     23FEB81

STATUS REPORT           FMP:30  SSN: ████████        PRINTED: 19 APR 82

████,UTE (F) 20 YRS   (23 MAR 62)
    161 ████████████ FORT ORD,CA 93941
    HOME: 394-████           WORK: 408-242-████          TMG: NONE

------------------------------- DIAGNOSES/PROBLEMS ------------------------------

    YMDY7    MEDICAL CARE PROBLEM                              23MAR82
    BMBF2    ADVICE & HEALTH INSTRUCTION                       22MAR82
    RMGJ8    PRENATAL CARE                                     14DEC81

----------------- SURGERIES, PROCEDURES, AND IMMUNIZATIONS -----------------

PROCEDURES
    VITAL SIGNS PROCEDURE                          14DEC81-2-26JAN82

STATUS REPORT                 FMP:30   SSN: ██████████         PRINTED: 19 APR 82

████████POSON (F) 25 YRS   (01 JUN 56)
     408 ██████████████ FORT ORD,CA 93941
     HOME: 384-██████                 WORK: 242-██████          TMC: NONE

-------------------------------- DIAGNOSES/PROBLEMS --------------------------------

     BHNK3-1 POSTNATAL CARE                                    12APR82
     RMGJ8   PRENATAL CARE                          10DEC81-5-22JAN82


------------------ SURGERIES, PROCEDURES, AND IMMUNIZATIONS ------------------

PROCEDURES
     PARTIAL PHYSICAL EXAMINATION                              22JAN82
     OTHER PROCEDURES                                          22JAN82
     VITAL SIGNS PROCEDURE                         30DEC81-2-08JAN82
IMMUNIZATIONS
     DIPTHERIA TETANUS AND PERTUSSIS                           12APR82
         VACCINE
     ORAL POLIO                                                12APR82


----------------------- VITAL SIGNS - LAST VISIT -----------------------

     WEIGHT                                 153          10DEC81-3-22JAN82


------------------ REFERRALS AND APPOINTMENT - LAST VISIT ------------------

                  APPOINTMENT IN 2 WEEKS WITH DR GOODELL      09DEC81

STATUS REPORT          FMP:30  SSN: ▓▓▓▓▓▓        PRINTED: 19 APR 82

████,NORMA (F) 24 YRS    (27 JUN 57)
    3135 ████████████ MARINA,CA 93933
    HOME: N ──────────── WORK: 242-████        TMC: NONE

------------------------- DIAGNOSES/PROBLEMS -------------------------

| HLCD3 | CONJUNCTIVITIS & OPHTHALMIA | 22JUL81 |
| RMGJ8 | PRENATAL CARE | 03DEC80-2-12DEC80 |
| RKCK2 | OTHER COMPLICATIONS OF FREGNANCY | 17NOV80 |
| RMFL9 | BLEEDING DURING PREGNANCY | 05NOV80 |
| BHNY8 | LETTER, FORMS, PRESCRIPTION WO EXAM | 28OCT80 |

STATUS REPORT          FMP:30   SSN:  ████████████       PRINTED: 19 APR 82

████████ANNETTE M (F) 22 YRS   (24 SEP 59)
     837 ████████████ FT ORD,CA 93941
     HOME: 384████████         WORK: 242████████          TMC: NONE


---------------------------------- DIAGNOSES/PROBLEMS ----------------------------

     RMGJ8    PRENATAL CARE                               21MAY80-4-18AUG80
     GGAM1-1  PRURITIS & RELATED                                   14AUG80
              CONDITIONS

"ASTHMA MEDS" AND LAST"ASA COMPOUNDS"> 0
THEN RECONSIDER "ASA COMPOUNDS" WHICH MAY INDUCE ASTHMA
CHECK NASAL POLYPS


ON "ASTHMA MEDS"
THEN ORDER "FEV1" AND ORDER "VC"

FIRST "BACITRACIN"
THEN IF FOLLOWED BY LAST "URINE PROT MG%"> 2
THEN CONSIDER BACITRACIN AS CASE OF PROTEINURIA


FIRST "BLEEDING SCREEN" ABNORMAL
THEN IF NOT FOLLOWED BY "BLEEDING SCREEN"
THEN ORDER "BLEEDING SCREEN"


FIRST "CARBAMAZEPINE"
THEN IF FOLLOWED BY LAST "WBC (THOU)" < 3.5
THEN CONSIDER CARBAMAZEPINE AS CAUSE OF LEUKOPENIA

ON "CARBAMAZEPINE"
THEN IF FOLLOWED BY LAST "NA+"< 135
THEN CONSIDER "CARBAMAZEPINE" AS CAUSE OF HYPONATREMIA




PLAN SET PROTOCOL

APPENDIX H

COLON CANCER SCREENING AUDIT

The audit was conducted by a Family Practice resident and represents a good example of both audit/evaluation and research/teaching potential of the CMRIS.

Fifty-one charts were selected based on age criteria. A chart audit of these patients using criteria developed by FPC physicians revealed:

a.  60% of the cases reviewed had at least one digital rectal exam during the period.

b.  Over half the patients audited (51%) did not have an office guaiac performed.

c.  Only 25% of the patients audited were given hemo-cult cards.

It is apparent that with improved data entry techniques and the formulation of a more acceptable status report, audits of this type can be greatly simplified thereby increasing the research and teaching value.  A plan set developed specifically around the colon cancer audit criteria could be developed to report only those cases where there is a deviation.  This would enable the use of a much greater sample size thereby improving data reliability.

# FAMILY PRACTICE CHART AUDIT

## MARCH 1982

Patient I.D. _____ (FMP & last 4 digits)

Auditor_____

PURPOSE: Assessment of the extent to which Family Practice residents and staff
conduct routine screening for colon cancer in patients over age _____.

During period of January 1980 through January 1982

1) Was a digital rectal exam done?

       twice ( )       once ( )       none ( )

2) Was an office guaiac performed?

       yes ( )       no ( )

3) Was the patient given hemocult cards for three consecutive stool samples?

       yes ( )       no ( )

4) If patient had guaiac positive stool, were any of the following studies done?

       proctosigmoidscopy  ( )

       barium enema       ( )

       colonoscopy        ( )

APPENDIX I

WORK LOAD REPORT

Although the SBHACH CMRIS version does not include

standard accounting parameters normally associated with

billing and accounts receivable, itemization of clinical

services is possible. The "number of visits by military

status" report is one example of a workload report designed

to meet clinics, Patient Administration, and Comptroller

requirements. This effort represents the first time that

outpatient work load data was collected and reported as a

by-product of an automated ambulatory system.

Since data collection requirements are an integral

part of the clinic personnel's responsibility, it is hoped

that such "by-products" will have an indirect effect on

patient care by freeing clinic personnel of some adminis-

trative tasks.

The work load reporting aspect of the CMRIS is only

in its infancy. As Phase Two implementation progresses, it

is anticipated that additional benefits can be derived from

the pharmacy and laboratory data. Certainly the population

served will be more easily identified thereby making long

range planning and utilization of resources more efficient.

MILCAT

| | TOTAL |
|---|---|
| DEPN ARMY RETIRED | 788 |
| ARMY RETIRED | 510 |
| ARMY ACTIVE | 328 |
| DECEASED DEPN ARMY RETIRED | 62 |
| DEPN AIR FORCE RETIRED | 23 |
| DEPN ARMY ACTIVE | 1621 |
| DEPN NAVY RETIRED | 54 |
| DEPN NAVY ACTIVE | 13 |
| NAVY RETIRED | 38 |
| DECEASED DEPN ARMY ACTIVE | 11 |
| DEPN MARINES ACTIVE | 6 |
| DECEASED ARMY RETIRED | 1 |
| AIR FORCE RETIRED | 12 |
| DEPN AIR FORCE ACTIVE | 5 |
| DEPN COAST GUARD ACTIVE | 6 |
| DEPN MARINES RETIRED | 1 |
| AIR FORCE ACTIVE | 3 |
| DECEASED ARMY ACTIVE | 2 |
| NAVY ACTIVE | 1 |
| DECEASED DEPN NAVY RETIRED | 1 |
| MARINES RETIRED | 1 |
| DEPN COAST GUARD RETIRED | 2 |
| DEPN | 2 |
| TOTAL | 3491 |

APPENDIX J

AUDIT FOR ACCURACY OF DATA INPUT

TO THE COSTAR SYSTEM

# AUDIT FOR ACCURACY OF DATA INPUT TO THE COSTAR SYSTEM

Method: The data entry clerks have been familiar with the system and have used the system since 12 November 1981. One hundred charts entered between the 9th and 22nd of February were randomly pulled and checked for errors and completeness.

| | Last Four | # of Entries | # of Errors | Status Report/ Encounter | Problem |
|---|---|---|---|---|---|
| 1. | 5776 | 2 | 2 | Status Report | Allergies not entered |
| 2. | 5776 | 2 | 0 | Encounter | OK |
| 3. | 2660 | 5 | 0 | Encounter | OK |
| 4. | 3297 | 2 | 0 | Encounter | OK |
| 5. | 0447 | 2 | 0 | Encounter | OK |
| 6. | 0637 | 5 | 0 | Encounter | OK |
| 7. | 7216 | 5 | 0 | Encounter | OK |
| 8. | 1663 | 5 | 1 | Encounter | Wrong B/P |
| 9. | 9402 | 5 | 0 | Encounter | OK |
| 10. | 7923 | 3 | 2 | Encounter | Wrong B/P, no diagnosis |
| 11. | 1040 | 2 | 0 | Encounter | OK |
| 12. | 6679 | 9 | 3 | Encounter | Wrong Temp & B/P, data not changed |
| 13. | 3730 | 5 | 0 | Encounter | OK |
| 14. | 1433 | 8 | 2 | Encounter | Wrong B/P, free text not entered |
| 15. | 6226 | 6 | 0 | Encounter | OK |

| | Last Four | # of Entries | # of Errors | Status Report/ Encounter | Problem |
|---|---|---|---|---|---|
| 16. | 8783 | 6 | 3 | Encounter | Wrong Weight, no diagnosis but they entered <u>Advise</u>. |
| 17. | 9876 | 4 | 3 | Encounter | Entered vital signs, none were taken |
| 18. | 1815 | 3 | 1 | Encounter | No diagnosis |
| 19. | 9562 | 3 | 1 | Encounter | No diagnosis |
| 20. | 7183 | 3 | 2 | Encounter | Wrong Temp, no diagnosis |
| 21. | 6047 | 3 | 1 | Encounter | No diagnosis |
| 22. | 4442 | 10 | 1 | Encounter | No diagnosis |
| 23. | 9622 | 5 | 1 | Encounter | Entered data that wasn't on encounter |
| 24. | 2695 | 6 | 1 | Encounter | Entered data that wasn't on encounter |
| 25. | 1967 | 3 | 0 | Encounter | OK |
| 26. | 0363 | 5 | 0 | Encounter | OK |
| 27. | 4241 | 6 | 1 | Encounter | Free text not entered |
| 28. | 1785 | 6 | 0 | Encounter | OK |
| 29. | 7671 | 8 | 1 | Encounter | Free text not entered |
| 30. | 6430 | 9 | 1 | Encounter | Wrong B/P |
| 31. | 1671 | 3 | 0 | Encounter | OK |
| 32. | 4817 | 4 | 2 | Encounter | Vital signs not entered |

| | Last Four | # of Entries | # of Errors | Status Report/ Encounter | Problem |
|---|---|---|---|---|---|
| 33. | 5496 | 6 | 0 | Encounter | OK |
| 34. | 7773 | 11 | 0 | Encounter | OK |
| 35. | 7725 | 4 | 0 | Encounter | OK |
| 36. | 0227 | 7 | 1 | Encounter | No diagnosis, but one was entered |
| 37. | 7030 | 4 | 1 | Encounter | Free text not entered |
| 38. | 5553 | 2 | 1 | Encounter | OK |
| 39. | 7034 | 2 | 0 | Encounter | OK |
| 40. | 5180 | 2 | 0 | Encounter | OK |
| 41. | 1514 | 2 | 1 | Encounter | Wrong FMP number |
| 42. | 9274 | 2 | 0 | Encounter | OK |
| 43. | 6291 | 9 | 0 | Encounter | OK |
| 44. | 9374 | 2 | 0 | Encounter | OK |
| 45. | 2328 | 2 | 0 | Encounter | OK |
| 46. | 1447 | 6 | 0 | Encounter | OK |
| 47. | 5406 | 6 | 1 | Encounter | No diagnosis entered |
| 48. | 5636 | 6 | 0 | Encounter | OK |
| 49. | 5636 | 5 | 0 | Encounter | OK |
| 50. | 6065 | 7 | 1 | Encounter | Free text not entered |
| 51. | 7270 | 3 | 1 | Status Report | Data not entered |

| | Last Four | # of Entries | # of Errors | Status Report/ Encounter | Problem |
|---|---|---|---|---|---|
| 52. | 6053 | 5 | 2 | Encounter | Wrong weight and B/P |
| 53. | 8579 | 2 | 1 | Status Report | Data not entered |
| 54. | 5575 | 2 | 1 | Status Report | Data not entered |
| 55. | 2020 | 5 | 4 | Status Report | Data not entered |
| 56. | 2920 | 2 | 1 | Status Report | Data not entered |
| 57. | 0824 | 5 | 0 | Encounter | OK |
| 58. | 3753 | 5 | 0 | Encounter | OK |
| 59. | 9302 | 6 | 0 | Encounter | OK |
| 60. | 0478 | 2 | 1 | Status Report | Data not entered |
| 61. | 0889 | 6 | 0 | Encounter | Original copy |
| 62. | 1925 | 5 | 2 | Encounter | Wrong weight, no diagnosis |
| 63. | 6600 | 9 | 1 | Encounter | Wrong B/P |
| 64. | 8962 | 5 | 0 | Encounter | OK |
| 65. | 7270 | 2 | 1 | Encounter | Data not entered |
| 66. | 1005 | 2 | 1 | Encounter | Data not entered |
| 67. | 6848 | 2 | 0 | Encounter | OK |
| 68. | 8579 | 6 | 0 | Encounter | OK |
| 69. | 8169 | 2 | 0 | Encounter | OK |
| 70. | 4597 | 2 | 0 | Encounter | OK |

| | Last Four | # of Entries | # of Errors | Status Report/ Encounter | Problem |
|---|---|---|---|---|---|
| 71. | 5814 | 3 | 0 | Encounter | OK |
| 72. | 9711 | 2 | 0 | Encounter | OK |
| 73. | 8848 | 2 | 1 | Encounter | Data entered on wrong date |
| 74. | 8206 | 3 | 3 | Encounter | Data not entered, child not on computer |
| 75. | 0807 | 3 | 1 | Encounter | No diagnosis |
| 76. | 5433 | 7 | 1 | Encounter | B/P not entered |
| 77. | 9588 | 2 | 0 | Encounter | OK |
| 78. | 2733 | 2 | 0 | Encounter | OK |
| 79. | 6586 | 1 | 0 | Status Report | OK |
| 80. | 1326 | 1 | 0 | Status Report | OK |
| 81. | 7671 | 1 | 0 | Status Report | OK |
| 82. | 0346 | 5 | 2 | Encounter | Wrong height and weight |
| 83. | 8949 | 9 | 2 | Encounter | Free text not entered |
| 84. | 6295 | 6 | 1 | Encounter | Diagnosis not entered |
| 85. | 3076 | 5 | 1 | Encounter | Diagnosis entered on wrong date |
| 86. | 9823 | 5 | 1 | Encounter | Diagnosis entered on wrong date |
| 87. | 0886 | 6 | 1 | Encounter | Diagnosis entered on wrong date |

| | Last Four | # of Entries | # of Errors | Status Report/ Encounter | Problem |
|---|---|---|---|---|---|
| 88. | 3428 | 6 | 1 | Encounter | Diagnosis entered on wrong date |
| 89. | 6679 | 9 | 0 | Encounter | OK |
| 90. | 6817 | 5 | 0 | Encounter | OK |
| 91. | 3088 | 1 | 0 | Status Report | OK |
| 92. | 4332 | 3 | 0 | Status Report | OK |
| 93. | 5848 | 5 | 0 | Encounter | OK |
| 94. | 0067 | 5 | 1 | Encounter | B/P not entered |
| 95. | 3467 | 5 | 1 | Encounter | Wrong B/P |
| 96. | 1120 | 4 | 1 | Encounter | Diagnosis not entered |
| 97. | 3279 | 2 | 1 | Encounter | Diagnosis not entered |
| 98. | 3890 | 6 | 1 | Encounter | Entered diagnosis that was not marked |
| 99. | 3562 | 5 | 1 | Encounter | No diagnosis entered |
| 100. | 1907 | 8 | 1 | Encounter | Head circumference was not entered |

100 Charts            Total number of entries:    443
53 with errors          Total number of errors:     73
47 without errors                      Error rate: 16.5%

BIBLIOGRAPHY

# BIBLIOGRAPHY

## Government Publications

U.S. Department of Health, Education, and Welfare. Health
Resources Administration. National Committee on
Vital and Health Statistics. Ambulatory Medical
Care Records--Uniform Minimum Basic Data Set: Final
Report. Vital and Health Statistics Documents and
Committee Reports, Series No. 4, nNo. 16. DHEW Pub-
lication No. (HRA) 75-1453. Washington, D.C.: Gov-
ernment Printing Office, August, 1974.

U.S. Department of Health, Education, and Welfare. Public
Health Service. Needed Research in the Assessment
and Monitoring of the Quality of Medical Care, by
Avedis Donabedian. DHEW Publication No. PHS-78-3219.
Washington, D.C.: Government Printing Office, 1978.

## Books

Adams, Francis, trans. The Genuine Works of Hippocrates.
Vol. 2. London: Sydenham Society, 1969.

Austin, Charles J. Information Systems for Hospital Admin-
istration. Ann Arbor, Mich.: Health Administration
Press, 1979.

Bataldin, Paul, and O'Conner, J. Paul. Quality Assurance in
Ambulatory Care. Germantown, Md.: Aspen Systems
Corporation, 1980.

Hodge, M. H. Medical Information Systems. Germantown, Md.:
Aspen Systems Corporation, 1977.

Joint Commission on Accreditation of Hospitals. Accredita-
tion Manual for Hospitals. 1982 Edition. Chicago:
Joint Commission on Accreditation of Hospitals, 1982.

_____. The 1982 Accreditation Manual for Ambulatory Health
Care. Chicago: Joint Commission on Accreditation of
Hospitals, 1982.

Weed, L. L. Medical Records, Medical Education, and Patient
Care. Cleveland: The Press of Case Western Reserve
University, 1969.

## Periodicals

Anderson, John E. "Reliability of Morbidity Data in Family Practice." The Journal of Family Practice 10 (April 1980): 677-83.

Austin, Charles J., and Carter, Harry S. "Hospital Information Systems and Quality Assurance." Hospital and Health Services Administration 26 (Fall 1981): 42-62.

Austin, Charles J., and Greene, Barry R. "Hospital Information Systems: A Current Perspective." Inquiry 15 (June 1978): 95-112.

Barnett, G. Octo, et al. "COSTAR--A Computer-Based Medical Information System for Ambulatory Care." Proceedings of the IEEE 67 (September 1979): 1226-37.

Barnett, G. Octo, et al. "Quality Assurance through Automated Monitoring and Concurrent Feedback Using a Computer-Based Medical Information System." Medical Care 16 (December 1978): 962-70.

Bass, Martin. "Approaches to the Denominator Problem and Primary Care Research." The Journal of Family Practice 3 (February 1976): 193-95.

Budd, Matthew A., and Reiffen, P. F. "Implications of Computer Science for Developing Ambulatory Medical Record Systems." Medical Care 11 (March-April 1973): 132f.

Christoffel, Tom, and Loewenthal, Martha. "Evaluating the Quality of Ambulatory Health Care: A Review of Emerging Methods." Medical Care 15 (November 1977): 877-97.

Demlo, Linda K., et al. "Reliability of Information Abstracted from Patient's Medical Records." Medical Care 16 (December 1978): 995-1005.

Escovitz, Gerald H., et al. "The Effects of Mandatory Quality Assurance: A Review of Hospital Medical Audit Process." Medical Care 16 (November 1978): 941-47.

Farley, Eugene S., et al. "An Integrated Medical Record and Data System for Primary Care: Introduction." The Journal of Family Practice 4 (May 1977): 949.

Frazier, William H., and Brand, Donald A. "Quality Assessment and the Art of Medicine." Medical Care 17 (May 1979): 480-90.

Froom, Jack. "The Age-Sex Register: Definition of the Patient Population." The Journal of Family Practice 4 (May 1977): 941-53.

Given, Charles W., et al. "Evaluating Primary Ambulatory Care with a Health Information System." The Journal of Family Practice 12 (February 1981): 293-302.

Grassman, Jerome H., et al. "An Automated Medical Record System." Journal of the American Medical Association 224 (18 June 1973): 1616-21.

Hill, Richard K. "Quality Assurance in Ambulatory Care." Primary Care 7 (December 1980): 713-19.

Hirschhorn, Norbert H., et al. "Quality by Objectives: A Model of Quality of Care Assessment and Assurance for Ambulatory Health Centers." Journal of Ambulatory Care Management 1 (January 1978): 55-73.

Huber, George A., et al. "Evaluating Computerized Screening as an Aid to Utilization Review." Inquiry 11 (September 1974): 188-95.

Hulka, B. S. "How to Evaluate Ambulatory Medical Care." American Journal of Public Health 70 (March 1980): 217-18.

Johnston, Maxene. "Ambulatory Health Care in the 80's—Looking Ahead to a Decade of Dilemmas." American Journal of Nursing 80 (January 1980): 76-79.

Kuhn, Ingeborg M., and Wiederhold, Gio. "The Evaluation of Ambulatory Medical Record Systems in the U.S." Proceedings of the IEEE 69 (January 1981): 80-85.

Lebow, Jay L. "Consumer Assessments of the Quality of Medical Care." Medical Care 12 (April 1974): 328-37.

Levinson, Daniel. "Information Management in Clinical Practice." The Journal of Family Practice 7 (October 1978): 799-805.

McDonald, C. J. "Protocol-Based Computer Reminders, the Quality of Care and the Non-Perfectibility of Man." New England Journal of Medicine 295 (9 December 1976): 1351f.

Manley, Sallie. "Majority of Hospitals Conduct Medical Audit." Hospitals 50 (1 June 1976): 88-89.

Martin, James B. "Towards Effective Computer-Aided Medical Care Evaluation Studies." Inquiry 15 (June 1978): 129-41.

Mills, Ronald, et al. "AUTOGRP: An Interactive Computer System for the Analysis of Health Care Data." Medical Care 14 (July 1976): 603-14.

Morehead, Mildred A. "Ambulatory Care Review: A Neglected Priority." Bulletin of the New York Academy of Medicine 52 (August 1979): 60-69.

Schmidt, Edward C., et al. "Computerized Problem-Oriented Medical Record for Ambulatory Practice." Medical Care 12 (April 1974): 316-27.

Schmitz, Homer, and Schoenhard, William C. "Automated Utilization Review Is Timely, Accurate, Efficient." Hospital Progress 57 (July 1976): 73-77, 98.

Shortridge, Mary Helen. "Quality of Medical Care in an Outpatient Setting." Medical Care 12 (April 1974): 283-300.

Somers, June B. "A Computerized Nursing Care System." Hospitals 45 (16 April 1971): 93-99.

Starfield, Barbara, et al. "Coordination of Care and Its Relationship to Continuity and Medical Records." Medical Care 15 (November 1977): 929-38.

Tufo, Henry M. "Better Patient Care through Self-Assessment." Patient Care 14 (5 February 1980): 182, 184, 189-98.

Vines, Diane. "Quality Assurance Program in Ambulatory Care." The Massachusetts Nurse 48 (February 1979): 1.

White, Nicole H.; Ryland, Merle A.; and Kubrin, Alan I. "A Model Approach." The Ambulatory Care Quality Assurance Project." Quality Review Bulletin 3 (October 1977): 10-11.

Wirtschafter, David, and Mesel, Emmanuel." A Strategy for Redesigning the Medical Record for Quality Assurance." Medical Care14 (January 1976): 68-76.

## Interviews

Armstrong, Chalmers, MC, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California. Interview, March, 1982.

Morrison, Jimmie, MC, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California. Interview, March, 1982.

Rampton, Mark E., MC, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California. Interview, March, 1982.

Sforza, Anthony, MC, Department of Family Practice, Silas B. Hays Army Community Hospital, Ft. Ord, California. Interview, February, 1982.

## Other Sources

American Society of Internal Medicine. _Assessing Physician Performance in Ambulatory Care_. Proceedings. San Francisco: American Society of Internal Medicine, 1976.

National Center for Health Services Research and Digital Equipment Corporation. Laboratory of Comuter Sciences. _COSTAR: Functional Specifications (Version 5.6)_. N.c.: National Center for Health Services Research and Digital Equipment Corporation, 1979.

TRIMIS Program Office, Computerized Medical Record Information System/Order Entry/Results Reporting Pilot Test, Silas B. Hays Army Community Hospital, Ft. Ord, California. Issues meeting, Washington, D.C., March 3, 1982.

Winickoff, Richard, et al. _A Computer Based Ambulatory Quality Assurance Program: Final Report_. Boston: Harvard Community Health Plan and Laboratory of Computer Science, 1979.

# DISCLAIMER NOTICE

**THIS DOCUMENT IS BEST QUALITY
PRACTICABLE. THE COPY FURNISHED
TO DTIC CONTAINED A SIGNIFICANT
NUMBER OF PAGES WHICH DO NOT
REPRODUCE LEGIBLY.**